San Francisco.
Oct 16th 1877.

Dear Doctor—

Your letter is before me—I sent my book to you because I have always admired you as a poet—and knowing that you ~~was~~ are a Prof. in the Medical Department of Cambridge I thought if you did not wish the book in your

in which request Mrs Poland most cordially joins me -

Very truly Yours,
H. H. Poland.

Libraries you could place it in that of the College.
No letter that I receive in reference to that book will be published. My object is not gain. The book is intended for Medical Students. Thanking you for your compliments. I will close with the hope that if you visit our Coast you will make my house your home while you remain

23 [illegible] (1877)

Compliments
of Author

LECTURES

ON

PRACTICAL SURGERY.

BY

H. H. TOLAND, M.D.,

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WITH

NUMEROUS ILLUSTRATIONS.

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Dedicated

TO THE STUDENTS

OF

THE MEDICAL DEPARTMENT OF THE UNIVERSITY

OF CALIFORNIA.

PREFACE.

Before the Toland College was transferred by the Trustees to the Regents of the University of California, and thereby became the medical department of that Institution, the students requested me to write a text-book; I told them that my engagements were so numerous that I could not find time to write a book with the scientific accuracy of some that had been published, but that if they were willing, I would *talk* a book that would contain the principles of Surgery, with illustrations from my own experience.

That proposition being agreeable, Mr. Marsh, one of the best stenographers of this city, was employed to take down my oral lectures before the class. These lectures were delivered extemporaneously, and should they contain anything not original, without an acknowledgment or quotation-marks, I wish it to be distinctly understood that the omission was not intentional.

H. H. Toland.

San Francisco, Cal.,
September 1st, 1877.

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APPENDIX.

LECTURES ON PRACTICAL SURGERY.

LECTURE I.

THE science of medicine embraces everything which has a tendency to preserve health or cure disease. For convenience it has been divided into medicine and surgery. The former includes remedies for all internal and functional derangements; the latter, remedies for organic and external lesions, which require either local applications or manual interference for relief.

So long as the surgeon occupied a less honorable position, and was only an assistant to the physician, this division was both convenient and necessary, but now in consequence of the great progress made in every department of surgery during the last half century, it becomes impossible to separate it entirely from medicine, and he who expects to succeed as a surgeon, without having a correct knowledge of every branch of the profession, will find that he is unable to compete with him who is not only familiar with the symptoms and pathology of diseases, but also understands perfectly the effect of remedies administered for their relief, and can appreciate their relative value in the different stages of the same affection.

The word surgery is derived from two Greek words, χειρ, the hand, and εργον, work, because the ancients supposed that manual dexterity was all that the surgeon required, as they were ignorant alike of the anatomy and diseases of the human body.

The surgeon during the last half century has not been considered inferior to the physician. He must be his equal in medicine to become eminent, and besides possessing a knowledge of the exact science of surgery with, to use the language of Celsus, "A hand steady, expert, and never tremulous, clear sight, and an intrepid mind," I will add, he should combine caution with mechanical genius.

For convenience surgery may be divided into theoretical and operative surgery.

The first includes the consideration of all surgical diseases, as well as the treatment of those which can be relieved without a surgical operation. They will constitute a very important part of this course of lectures, and if I have the ability to present them properly, much the most useful to the class.

Operative Surgery is divided into Minor and Major Surgery. The former includes the application of bandages, the dressing of wounds, and, indeed, all the small but exceedingly important details necessary in practice. They require less nerve, less skill, and involve less responsibility, but to the general practitioner are much more important than great, or, as they are called, capital operations, which Major Surgery includes. It is divided into Military and Conservative or Plastic Surgery.

The former embraces the operations that are performed either on the battle-field, or after the wounded have been removed, as well as the treatment of gunshot wounds generally.

The latter has within a few years made more rapid progress than any branch of the profession, and I think it can, to the honor of American surgeons, be said that they have contributed more than those of any other country to the development of important improvements in operative surgery. When I have saved a condemned limb, restored a lost part, or have otherwise prevented or removed deformity and mutilation, I feel my pride for the profession increase, and a consciousness that I have been compensated for the toil and anxiety all must encounter to obtain even a respectable position in the profession. The surgeon who avails himself for the benefit of his patient of everything which both science and art contribute, should not be confounded with the knife's-man, whose highest ambition is to obtain notoriety by the unnecessary and consequently reckless waste of human blood.

In order to prevent repetition during the remainder of this course of lectures, there are some general considerations for the management of surgical cases to which I now propose to direct your attention.

If it be possible to arrest a disease and restore a patient to health by other means, never perform a surgical operation. When the lymphatic ganglions are enlarged in scrofulous subjects, those who rely exclusively upon the knife frequently remove them, and in a

short time the difficulty reappears, and will continue to increase until its progress is arrested by a judicious course of medical treatment.

The most serious consequences occasionally result from the slightest operation. When a constitutional derangement exists which the most experienced may fail to detect, death may result from cutting a corn, or the removal of a simple encysted or adipose tumor. Such a casualty, besides the sacrifice of a human life, always injures the reputation of a young surgeon.

For the same reason in malignant diseases, and particularly when the evidences of a cancerous diathesis exist, avoid an operation if possible. The disease in such cases almost always returns if removed, and it is very doubtful whether the life of a patient can even be prolonged by any course of treatment that can be adopted. Surgeons of established reputation may not adhere rigidly to this course, yet they should, and in future I have resolved never again to use the knife when it affords no chance even to arrest the ravages of disease. In curable cases, even when the life of a patient is not in imminent danger, never persuade any one to submit to an operation, except in strangulated hernia, or aneurism of the arteries of the extremities, or stone in the bladder; then it is perfectly justifiable, with the consent of the friends, to administer an anæsthetic and perform the necessary operation. In all other cases, put the question, as Dupuytren always did, with a knife in his hand, "Will you be operated upon or not?" and then if not successful you will have nothing to regret, or anything with which you can reproach yourself.

After a patient has consented, and when placed upon the table, if an extraordinary dread of the consequences be apparent, I would advise you by all means to defer the operation until the mental condition improves, and if more favorable circumstances do not present, it should be indefinitely postponed. If that course is not adopted in such cases, the system may never react, stimulants will produce no effect, and the patient will sink as rapidly from a simple wound as from the shock resulting from an extensive burn or the crushing of one of the lower extremities.

Dupuytren removed a small encysted tumor from the back of an apparently healthy young man. He consented to the operation, but had a presentiment that it would prove fatal. He was only a few minutes on the table, lost but little blood, but reaction did not come

on, and he died the next morning, having met the fate he anticipated and so much dreaded.

When you have decided that surgical interference is necessary, and the consent of the patient has been obtained, the operation should be performed at the earliest moment possible. Nothing exerts so injurious an effect as dread and suspense. The sleep is disturbed, the secretions are deranged, the appetite is impaired, and in many cases the delay of only a few days will produce so much constitutional disturbance that serious consequences may follow the infliction of a slight wound. I have known surgeons of great eminence who from the press of other engagements would defer from day to day an operation which was regarded as necessary and even indispensable, and have observed the effect to be so decidedly injurious that I have always pursued a different course, and have never had reason to regret that it was adopted.

Always operate in the morning. Nine o'clock is the hour I have selected, and then if secondary hæmorrhage should occur it can be arrested before night. Nothing is more unpleasant than to be obliged to ligate a bleeding vessel by an artificial light.

When the consent of a patient has been obtained, and the time fixed, be careful always to fulfil your engagement, if you expect to succeed. By procrastination the confidence is either diminished or the impression is made that the case is one of a very serious character, which will diminish the chance of success. Should the general health be deranged, before any definite arrangement is made respecting an operation, if it be possible, suitable remedies should be administered, and a proper regimen enjoined to remove the constitutional derangement that exists.

In order to diminish the shock necessarily resulting from operations of an extensive character, an anæsthetic should always be administered, and the only reliable agents of this character are sulphuric ether and chloroform. The choice between the two should depend upon the character of the case, and the age and constitution of the patient. If the operation be neither very painful nor tedious, and the patient be very young or old and infirm, then I think ether alone should be preferred.

In some of the Eastern hospitals a combination of one part of chloroform to three parts of ether is employed, because it acts more promptly than the ether alone, and is considered less dangerous than

chloroform. When the constitutional energy is not too much impaired by disease, and the operation must necessarily be both painful and tedious, and if I can obtain an experienced assistant to administer the chloroform, I prefer it either to ether alone or the compound. It is prompt in its action, and safe when properly administered and carefully watched. The effect is more durable, and the sensibility of the patient more effectually destroyed.

Always avoid the different machines that have been invented called inhalers, because they do not permit a sufficient quantity of atmospheric air to pass into the lungs with the chloroform, to render its use in any case safe. The safest and most simple method is to place a folded towel over the face, and apply fifteen or twenty drops of chloroform upon the external fold about an inch below the nose, and renew the application as often as it becomes necessary by evaporation, until the desired effect is produced. Dressing forceps should always be placed near the assistant, so that he can, should the breathing become stertorous, and the face livid, seize the tongue and prevent suffocation by its retraction. The tongue being secured, should the respiration remain difficult, or cease entirely, sudden and sufficient pressure should be made upon the chest to expel the air from the lungs, and when removed it generally rushes in and respiration is again established. If not, the effort should be repeated, and if ineffectual, artificial respiration should be speedily substituted. When administered as directed, and with the precautions recommended, chloroform is safe, yet I must acknowledge that an extensive experience has rendered me more cautious than formerly, and I now think that an electro-magnetic machine should always be at hand when the protracted use of chloroform is considered necessary, for it removes or counteracts the anæsthetic effect with more certainty than any other treatment that has been recommended.

Caution is necessary in the use of every powerful remedy, and should chloroform appear to act unkindly, then ether should be substituted to keep up the effect so long as may be necessary. The inexperienced should always employ ether. The combination administered carelessly is more dangerous than either separately. It is the anæsthetic I employ in ordinary cases, particularly if my assistant has not had considerable experience in the administration of chloroform.

Anæsthetics should not be passed over hastily; they are to the

surgeon what steam and the telegraph are to commerce and civilization, and their discoverer deserves as lasting a monument as Morse or Fulton. No doubt will be entertained of the truth and correctness of this assertion, when the vast amount of human life and suffering that have been saved since the discovery was made is taken into consideration. They render incalculable assistance to the surgeon. He feels that he can operate carefully and leisurely without distressing his patient, and is entirely relieved from the inconvenience resulting from the resistance the bravest are unable entirely to control.

Never make a display of instruments. The patient should not be allowed to see them, because it has a demoralizing and consequently an injurious effect. After anæsthesia has been induced, select such instruments as are necessary, and place them, with water, sponges, bandages, and ligatures, in a convenient position. Assign to each assistant the part you expect him to perform, so that hæmorrhage may be promptly arrested, and the operation completed in the shortest time possible compatible with safety. The instruments needed are few and simple. A surgeon could hold in his hand almost all that are necessary to perform every operation in surgery, and should he visit the salesroom of an instrument-maker, he would only be astonished and bewildered by the number and variety exhibited. Many of them which may be useful to the young and inexperienced can be dispensed with by the surgeon. I would advise you therefore to keep but few instruments, and keep them well. Always carry with you a small pocket-case which contains a male and female catheter, cutting instruments, needles, and ligatures, and then you will be prepared for almost any emergency.

After an operation has been completed, the arteries should all be secured, and then if union by the first intention is desired, the wound should not be closed for at least an hour after the hæmorrhage has been arrested. The edges should, after being perfectly cleansed, be approximated and retained in contact by the interrupted silver suture. They should be inserted about half an inch apart, and if the wound be deep, at least half an inch from the edges, and extend if possible to its entire depth.

Should a perfect coaptation not result from the sutures, either a narrow strip of isinglass or common adhesive plaster should be applied between each; or what may be preferable, should irrigation be considered necessary, a fine suture should be inserted composed of

common sewing silk, which should be removed on the third day, to prevent ulceration.

It is customary to remove all the sutures on the third or fourth day; they may, however, be allowed to remain seven or eight days, or longer, and even until the wound heals by granulation, should union by the first intention fail to occur.

By being careful to secure all the bleeding vessels with ligatures which correspond with them in size, you may perform thousands of operations without in a single case being compelled to remove the dressings for the purpose of arresting hæmorrhage, which is always exceedingly unpleasant to the surgeon and decidedly injurious to the patient. After the wound has been properly closed, apply lint wet with warm water, which should be covered with oiled silk, and secured by a suitable bandage. This dressing should be changed three or four times a day, to prevent the lint adhering to the wound and becoming an obstacle to the escape of the secretions, which if retained, would render union by the first intention impossible. Should it be found from the location of the part inconvenient to make this application, then simple cerate should be substituted. When union by the first intention is not desirable, wet lint should be placed between the edges of the wound and the water dressing applied. The lint should be wet, because when in that condition it does not adhere, and will allow the secretions to escape readily, and when, on the third day, its removal becomes necessary, neither pain nor difficulty will be experienced.

So soon as an operation is completed, and before the hæmorrhage has been arrested, administer a full dose of sulph. morph., at least half a grain to an adult male, with directions to repeat half the quantity every hour until it affords relief. I think this is more important to success than the skilful use of the knife, the careful adjustment of the dressings, or, indeed, everything connected with the operation combined. Sometimes after a tedious and difficult operation, reaction does not take place readily; then besides the morphia, brandy should be administered, and the patient watched until reaction is fully established. Morphia in such cases not only relieves pain and hastens reaction, but also prevents inflammation, and is consequently more valuable to the surgeon than every other agent within his control. The preceding remarks include only such things

as occur in every operation, and to avoid repetition, I concluded in the first lecture to refer especially to them.

Idiosyncrasy is another subject to which I also propose to direct your attention. This is a peculiarity of constitution which causes a medicinal agent to produce an effect different from that generally expected to result from its use. Opium, which to the surgeon is the most valuable article of the Materia Medica as an internal remedy, occasionally produces violent gastric pain, as severe as that experienced in colic, which continues so long as it remains in the stomach. It would therefore be exceedingly important, before performing a dangerous operation, to ascertain whether any such peculiarity exists. During the preliminary treatment some preparation of opium should be administered, and if the effect is not satisfactory, experience has taught me that in such cases it may be applied endermically with the most happy result.

Mercurials also act very unfavorably in *some* cases. They not only produce sickness of the stomach and even violent vomiting, but also the most distressing ptyalism, or salivation, as it is usually called. This effect may be produced by the smallest quantity, and is always unpleasant, and might, under certain circumstances, be exceedingly injurious; because it is usually accompanied with fever and a profuse and offensive salivary secretion, which renders it impossible for sufficient sleep to be obtained.

Ol. ricini, which is generally regarded as a mild and simple purgative, sometimes produces the most distressing tenesmus, and consequently should be avoided, unless it had been previously administered, and found to produce its usual effect. In consequence of the poisonous properties of shell-fish, particularly if they are not fresh, they should be positively prohibited, so long as any unfavorable effect that might result from their use could be attributed to the operation.

Many patients are lost by proper attention not being paid to the subsequent treatment. Before closing this lecture I will direct your attention to other difficulties, which may assume a very serious character after injuries, extensive operations, compound fractures, contused wounds, erysipelas, or any disease by which a patient may be confined in a recumbent position for four or five weeks consecutively.

1st. Congestion is an inordinate or unnatural accumulation of blood in the vessels of any part of the body, and may result either

from an increased action of the arteries by which it is supplied with blood, or from venous obstruction.

The former is called active congestion, and the latter passive. In the active form, the vessels are distended, the part is red and presents the appearance of being inflamed without exhibiting any of the other indications of that affection, although they may occur at any moment, as that is usually the condition a part presents before the development of acute inflammation. In passive congestion, the part is generally livid, and somewhat swollen, in consequence of an accumulation of venous blood. It occurs frequently in the lower extremities, and depends on or is produced by a dilatation, elongation, and thickening of the veins. The valves in consequence of the dilatation do not perform their function, and if proper treatment is not adopted, the integument inflames, is absorbed, and a very troublesome ulceration is the consequence.

The form, however, of passive congestion to which I now desire particularly to direct your attention, is that which occurs in the posterior portion of the lungs, produced by confinement upon the back sufficiently long for the blood to accumulate in that portion of the respiratory apparatus by gravitation. In a case of fracture of the neck of the femur which occurred in this city a few years since, in which the patient was confined too long, after complaining a few days of difficulty of breathing, he was attacked with hæmorrhage from the lungs. The splint was then removed and his position changed. The congestion soon disappeared, and he is now in good health.

This should be carefully guarded against, and being aware that danger may arise from such a source, we should always, so soon as the condition of the patient will permit, insist on a frequent change of position, in order to avoid congestion, as well as bed-sores, which are, although more annoying, unless extensive, much less dangerous. In the latter affection, before the skin ulcerates, it by position becomes congested; if that is not relieved it inflames, and ulceration follows, an event which is always annoying to the patient and exceedingly troublesome to the physician. These serious and too common complications can almost always be prevented by proper attention.

In erysipelas as well as in every other protracted disease, the position should be changed as frequently as possible, to prevent congestion, not only of the lungs, but also of other important organs.

LECTURE II.

GENTLEMEN: For the same reason before assigned for introducing idiosyncrasy, I to-day propose to say a few words about sympathy, irritation, irritants, etc.

By sympathy we understand the connection that exists between two or more separate organs, by which the disease of one is transmitted secondarily to the other. The knowledge of the sympathetic relation of organs is of great importance in the practice of both medicine and surgery. For convenience it is divided as follows:

1st. Sympathy of contiguity.
2d. Sympathy of continuity.
3d. Remote sympathy.

It is not surprising that organs in close proximity should take on either the same diseased action or suffer greater or less derangement of function, in consequence of the existence of disease in a neighboring organ. In hæmorrhoids, after the tumors have been strangulated by the application of a ligature, an inability to pass the urine frequently follows the operation so soon, that the derangement of the function of the bladder could not result from inflammation, and can only be explained by attributing it to contiguous sympathy.

When a calculus is passing from the kidney to the bladder, the pain, always excruciating, is greatly aggravated by a violent contraction of the spermatic cord, with a retraction of the testicle. This occurs in every case of this character, and cannot be otherwise satisfactorily explained.

Continuous Sympathy.—When a patient has gonorrhœa, and either is badly treated, has taken violent exercise, or has lived imprudently, the discharge frequently ceases suddenly, and the inflammation extends either to the bladder or testicles, and produces a difficulty much more serious than the original, and when that is relieved, all the symptoms of gonorrhœa return.

After any operation for the removal of hæmorrhoidal tumors, the inflammation may extend from the lower extremity of the rectum

upwards, until the mucous membrane becomes so extensively and seriously involved as to prove speedily fatal.

When an organ distant from the one diseased becomes affected, it is said to depend on remote sympathy, which may result from nervous connection, or from both organs being engaged in the same function. When the uterus is ulcerated or otherwise diseased, the mammæ sometimes become so enlarged, and are so painful, that they attract more attention than the organ in which the disease exists.

The same sympathetic connection exhibited between the uterus and mammæ, is known to exist between the parotid gland and testicles, and as in the preceding example, the sympathetic affection is much more serious than the original difficulty. The sympathetic relations that exist between all the different organs of the body would be enumerated, if it were not an intrusion upon the rights of the professor of the theory and practice of medicine.

Irritation or Increased Determination.—Whenever the vital action of a part is excessive, indicated by increased sensibility and vascular fulness, it is said to be irritated. Irritation differs in degree, and its character depends on the nature of the irritant applied, and the constitutional effect depends upon the extent of the irritated surface.

When a gentle irritant is applied to a secreting surface, the natural secretion is increased. The presence of tobacco in the mouth and nose will increase the activity both of the salivary glands and the Schneiderian membrane. A drop of alcohol, a solution of alum or nitrate of silver, applied to the eye, increases the action of the lachrymal glands, and a profuse secretion is the result, which will soon subside when the cause is removed. Condiments have the same effect both on the mucous membrane of the mouth and stomach. If applied frequently, the sensibility of the part is diminished, and they ultimately become indispensable to enable the organ to perform its function. They may become the cause of disease, and consequently should be avoided.

Irritants are valuable remedies, both to the surgeon and physician, and you cannot be too familiar with the articles employed, the peculiarity of their action, and the extent to which they may be judiciously carried. You should avoid the use of powerful irritants in the treatment of the diseases both of children and delicate women. As a local irritant for young children, flannel wet with warm vinegar, covered with oiled silk, and renewed three or four times in twenty-

four hours, is superior to anything that can be applied. It irritates moderately, and even sometimes vesicates slightly, if continued three or four days, and then the warm water dressing may be substituted. In such cases I rarely make a more active application, for when the vinegar is strong and properly applied, it fulfils the indication.

In the treatment of the diseases of females, never apply tartar emetic ointment. The distress resulting from its use produces fever, and it fails to afford the relief anticipated.

If counter-irritation be necessary in such cases, apply twenty drops of croton oil, and rub it in well with coarse paper. It should not be applied to too extensive a surface, nor repeated after the peculiar eruption begins to appear.

When a blister is required, nothing is equal to Birt's blistering fluid. It rarely produces strangury, and it vesicates in three or four hours. It is less painful than blistering ointment, and as a counter-irritant, is equally as efficacious. The warm water dressing should be applied, and continued until the blister heals. It is always better to reapply the fluid than to resort to irritating substances, either to increase or protract the discharge from a blistered surface.

Many think that if a small blister be useful, the benefit will increase with the extent of the blistered surface, an opinion which is as erroneous as could be entertained. Large blisters are exceedingly injurious, in consequence of the constitutional disturbance resulting from the irritation of so extensive a surface. They become also, in delicate and emaciated subjects, exceedingly debilitating, from the great quantity of serum as well as pus that may be secreted by the denuded surface. Never vesicate larger than six inches square, it being better to reapply the fluid in a few days than to blister a larger surface.

A great variety of rubefacients are employed, many of which are useful counter-irritants, and will receive the attention they respectively deserve, when they are considered especially applicable to the disease under consideration. The more active will be included under the head of poisons, and the peculiarity of their action more particularly described.

The diseases which belong to the department of surgery always present structural derangements, except when foreign bodies have been introduced into the nares, ears, or air-passages, or form in the ducts of the salivary glands, or in the internal cavities by a deposi-

tion from the fluid they usually contain, as gallstones and urinary calculi. These structural derangements may result from mechanical violence, which include wounds, contusions, and every casualty to which the human body is exposed. They may also result from deranged nutrition, and as the structural lesions, except those specified, are produced by inflammation, that should next be considered.

What is inflammation? The following is the best definition which I can give you. It is a disturbance of the nervous energy, accompanied with a perverted action of the capillary system, generally attended with increased heat, pain, redness, and swelling. Some think that the most important element is the perversion of the vital action of the part affected. This is "considered essential and never failing."

Inflammation forms a very important subject in surgery, and consequently should receive your especial attention.

It may be divided into healthy and unhealthy inflammations. By the agency of the former all wounds are healed and injuries repaired; without it no ulcer would granulate and cicatrize, and consequently every operation performed on the human body must necessarily prove fatal. When healthy it is the surgeon's friend. If not well understood, however, and properly treated, it may become unhealthy, and then consequences more or less serious and alarming must result. When the nervous shock is not sufficient to destroy life before reaction occurs, every injury is followed by inflammation, which may become beneficial or destructive in proportion to its character and violence.

The symptoms of inflammation are both local and constitutional. The local symptoms are, 1st. *Heat.* A burning sensation is not only experienced in the part affected, but the temperature is also elevated notwithstanding the opposite opinions of Hunter and other distinguished pathologists, who, after experimenting extensively, arrived at the conclusion that it did not exceed that of the centre of the body. The experiments of Professor Gross, Andral, and others, prove conclusively that the temperature of an inflamed part frequently reaches 106° Fahrenheit, and also, that if the inflamed surface is not exceedingly limited, the temperature is always increased. This elevation of temperature results from the increased action of the heart and arteries, and may depend both on the friction resulting from the blood passing rapidly through the vessels, and

the increased oxygenation produced by the accelerated respiration which always accompanies increased arterial action.

When the action of the heart is increased the heat of the body is always elevated; but so soon as the former is diminished by the administration of proper remedies, both the respiration and heat become normal.

If increased vascular action elevates the temperature of the body we may reasonably conclude that in inflammation, so long as the temperature is elevated, the action of the vessels in the part affected is also increased. Volumes have been written upon this subject without contributing anything either to the pathology or treatment of inflammation.

The point then in controversy was, Does more blood pass through the vessels of an inflamed part than when it is in a natural and healthy condition?

The vessels circulate *more* blood so long as the action is purely inflammatory, and *less* for a short time before the termination or result becomes manifest.

2d. *Pain* almost always exists in inflammation, and is generally in proportion to the violence of the diseased action and the sensibility of the part affected.

When serous membranes are inflamed, as the pleura and peritoneum, the pain is sharp and lancinating; but when the body of an organ, as the liver, becomes inflamed, the pain is less acute, and is described as being of a dull and throbbing character. In consequence of the great sensibility of the eye, the pain is acute and lancinating, but not so violent as that experienced in otitis and in inflammation of the frontal sinus, which is usually mistaken for and called neuralgia. It is intermittent and resists the action of the remedies usually prescribed in such cases, and indeed everything fails to give relief except the endermic use of morphia. The pressure to which the inflamed mucous membrane is subjected, by the parietes of the frontal sinus and the bony structure of the ear, accounts for the violence of the pain in these affections.

When mucous membranes are inflamed the pain is of a burning or scalding character, as in inflammation of the bladder, urethra, or rectum. Pain is not always felt in the part affected. When the bladder is inflamed by the presence of a calculus the pain is always greatest at or near the glans penis.

When the kidneys are diseased the patient suffers more from a burning sensation near the extremity of the urethra than in the organs affected. It is necessary to understand the difference between the pain resulting from spasm, distension, and inflammation. When a gallstone is passing through the ductus communis choledochus, or a urinary calculus through the ureters, the pain is more excruciating even than that experienced in inflammation of the ear, frontal sinuses, or teeth. In a case treated some years since, during the passage of a gallstone, the pain was so violent as to produce convulsions, and was only palliated by venesection, the warm bath, and the administration, in less than two hours, of an ounce of the tincture of opium.

In neuralgia, which is a much-abused word, the pain is sharp, lancinating, and generally intermits. It is not accompanied by the ordinary indications of inflammation, and the pain is always relieved by pressure. Instances of this affection are exceedingly rare, although they occasionally occur. Almost all that receive that name and are treated as purely nervous, depend on inflammation, either of the part complained of, or of the nerves by which it is supplied, or else arise from sympathy with either a contiguous or distant suffering organ.

Patients suffer very differently from the same degree of inflammation, a circumstance which depends on a peculiarity of organization called idiosyncrasy. Sometimes, when inflammation and ulceration exist, but little pain is experienced, as in typhoid fever. There is generally some tenderness on pressure being made over the inflamed intestine, but not sufficient to attract the attention of the patient, or excite the apprehension of the physician.

Pain results generally both from the pressure made by the distended bloodvessels on the accompanying nerves, and from inflammation of nerves themselves. It is, in inflammation, fortunately rarely absent, and is great in proportion to the violence of the inflammatory action. It is the most useful and valuable guide to the surgeon in the selection of proper remedies; and it compels the patient to remain in the most favorable position, which has great influence in such cases either to increase or alleviate pain. This is strikingly illustrated both in whitlow, and in inflammation and ulceration of the lower extremities.

3d. *Redness.*—As this is produced by the distension of the bloodvessels, and particularly those which do not usually circulate red

blood, it must necessarily vary in hue from the lightest pink to the deepest purple, according to the peculiarity of the part inflamed, and the violence and character of the morbid action.

The livid appearance presented in derangements of the respiratory function, and in ecchymosis, particularly after operations on the genital organs, or in cases where an obstruction or interruption of the venous circulation of the part exists, should not be mistaken for and treated as one of the most serious terminations of inflammation.

The redness of the conjunctiva, when inflamed, results from the presence of red blood in vessels which in a healthy condition never receive the red globules. In other organs, the intensity of the color depends on the vascularity of the part affected It is very conspicuous in inflammation of the skin, the mucous and serous membranes, as well as in inflammatory affections of the viscera both of the chest and abdomen; on the contrary, in inflammation of the bones, ligaments, and tendons, and particularly the latter, red vessels can with difficulty be detected, even when the inflammation is so violent as to destroy the vitality of the part in a few days. The same is true in inflammation of the cornea, an ulcer frequently appearing upon the corneal surface, particularly in strumous ophthalmia, without being preceded by much redness even of the conjunctiva.

The character of the inflammation may generally be determined by the color presented. It is bright red when located in the skin or throat, brown in iritis, and yellowish or copper-colored in secondary syphilitic affections. The edges of a scrofulous ulcer are usually livid and elevated, and when mortification takes place, the part implicated is always grayish or black.

The discoloration resulting from inflammation is named according to the appearance it presents; when extensive, it is said to be *diffuse; linear*, when long, narrow, and following the course of the veins or lymphatics; *maculiform*, when it presents the appearance of a stain or blotch; *punctiform*, when small and distinct points of the skin or mucous membrane are only diseased; and *arborescent*, when it spreads from a centre, like the branches from the trunk of a tree, or the veins from the common stem of a leaf.

4th. *Swelling.*—This results from the distension of the bloodvessels and the effusion into the cellular tissue, separately or conjointly, of serum and coagulable lymph, which is the albuminous part of the blood. The amount of swelling depends on the part affected.

Bones, fibrous tissue, vessels, and nerves, as well as the cornea and sclerotic membranes of the eye, and most of the viscera, do not swell so rapidly and extensively as do the scrotum, vulva, conjunctiva, glottis, tonsils, and the upper part of the face, in consequence of the latter being abundantly supplied with cellular tissue. An inflamed part generally enlarges slowly, and sometimes the swelling only appears when the diseased action is disappearing; and it depends on the effusion of serum, by which the distension of the vessels is relieved.

It occasionally, however, increases with great rapidity, as after severe injuries, the sting of poisonous insects, the bite of the rattlesnake, or the action of both vegetable and mineral poisons. Swellings differ in character. When soft, they depend either on the simple dilatation of the bloodvessels, or the effusion of serum in the cellular tissue. When firm or solid, they are generally produced by the effusion and organization of plastic lymph. They may be either beneficial or injurious; beneficial, when the secretion of serum depletes the inflamed and distended vessels; injurious, when the tumor, by its size, disturbs the circulation so much as to produce strangulation and death, as in the cornea when the conjunctiva is violently inflamed; and as in suffocation, when the glottis is so much swollen as to prevent the admission of atmospheric air into the lungs.

Functional Derangement.—By function we understand the office performed by every distinct organ or tissue of the human body.

When the organ is inflamed, the function is always imperfectly performed, and frequently entirely suspended. This applies to absorption as well as to the other functions.

The sensibility in such cases is always greatly increased, which is as apparent when pressure is made in gastritis, peritonitis, and enteritis, as in carbuncle, erysipelas, and hæmorrhoidal tumors. Parts destitute of sensibility, such as bones, tendons, and fibrous tissue, when inflamed, become exceedingly sensitive. There is also an increase of irritability, particularly of the viscera of the abdomen. The stomach, when inflamed itself, or when any of the digestive organs are suffering from acute inflammation, frequently becomes so irritable that nothing can be retained; this irritability of the muscular coats of the bladder and intestines is a source of great distress both in cystitis and enteritis.

Causes of Inflammation.—These should be divided into the predis-

posing and exciting causes, and the former are either natural or acquired.

To the natural predisposing causes belong hereditary constitutional peculiarities, which render the subject more susceptible to gout, rheumatism, and scrofula, when exposed to the exciting causes, than if no such predisposition or constitutional peculiarity existed. To the acquired predisposing causes belong such as result from temperament, occupation, age, and excesses of every description. Whatever has a tendency to impair the health by deranging the secretions predisposes to inflammation.

Exciting Causes.—These are numerous, and may be divided into local and constitutional causes, or into those which are applied to the part affected, and those which act through the general system. The *local* causes are either chemical or mechanical; as examples of the former may be mentioned heat, acids, alkalies, tartarized antimony, corrosive sublimate, ol. tiglii, rubefacients, blisters, and every agent which acts promptly and violently. The mechanical local causes are wounds, contusions, dislocations, and fractures, as well as distension of the ligaments of the joints or the urinary bladder. A foreign body either in the air-passages or any other portion of the body may produce inflammation.

Constitutional Exciting Causes.—It is impossible to determine the *modus operandi* of many of these agents. Cold and heat are the most prolific of all. The former produces inflammation of the throat and respiratory organs, and the latter diseases of the liver and other abdominal viscera.

Excessive hæmorrhage from any cause, as well as extensive and violent contusions, either from firearms or other weapons, are always serious, and may be followed by violent inflammation.

It may also result both from sympathy and metastasis; from sympathy, as in ophthalmia, because the organs are engaged in the same function; from metastasis, when inflammation appears either in a contiguous or distant organ, soon after disappearing suddenly from its original position, as when the brain becomes diseased from a metastasis from the scalp.

Constitutional Disturbance.—This depends both on the character and extent of the diseased action. When limited and located in an unimportant part, it is not recognized by the system, but when extensive, even if not intense, violent constitutional symptoms, called

fever, are produced, which may be either sthenic or asthenic. The latter is usually called typhoid.

When persons in good health, and not advanced in life, are exposed to the causes by which inflammation is usually produced, for a greater or less period, which depends on the activity of the cause and the vitality and vascularity of the part, they complain of aching and feebleness of the lower extremities, pain in the back, chilliness, headache, loss of appetite, and indeed of all the symptoms which precede a paroxysm of malarious fever. In such cases the chill is generally short, and is followed by fever, which is characterized by a full, strong, and frequent pulse, increased heat of the entire surface of the body, great thirst, violent pain in the head, hurried respiration, and a disturbance of all the secretions. No benefit would result from the enumeration and specification of the precise change which each undergoes in such cases, even if it were possible.

When, however, peritonitis exists, the pulse is usually hard, small, and quick; and if there were not great pain and tenderness on pressure, the pulse alone might deceive the inexperienced, and cause an improper course of treatment to be adopted. This form of fever usually remits in the morning, and always increases during the afternoon and evening. Should it remain uncontrolled, the fever will continue and the strength decline, until the symptoms become either typhoid or hectic, according to the character of the local difficulty.

Asthenic inflammatory fever results from the same causes as the preceding, the effect being modified by the constitution of the patient. The dissipated, badly fed, and crowded residents of large cities, are particularly liable to this form of fever, which is much more serious and fatal than the sthenic. The period of depression is decided, and sometimes protracted, and when reaction does take place, the pulse is feeble and quick. The heat of the body, particularly of the chest, is pungent. The tongue is sometimes brown and dry, but more frequently pointed and red. The cheeks are generally flushed, and the teeth very soon become covered with sordes. Delirium occurs early, and may be accompanied either by stupor or by inability to sleep.

When symptomatic fever, whether of sthenic or asthenic form, terminates favorably, critical evacuations frequently occur, such as profuse perspiration, diarrhœa, or hæmorrhage; but fatal coma and death are preceded by subsultus, hiccough, dyspnœa, and coldness of

the surface, which are all produced by one or more of the internal organs becoming implicated.

In inflammation the blood undergoes several changes. The most important and decided is an increase of fibrin and the number of the colorless globules. Pathologists give the proportion of fibrin to the entire mass of blood as 3 to 1000; but in inflammation it may be as high as 9 or 10 to 1000. It is believed that the quantity continues to increase until the inflammation begins to subside; then it diminishes in the same ratio. In consequence of the increase of fibrin, when blood is drawn rapidly from a vein, particularly if it falls into a deep and narrow vessel, the blood presents what is called the buffy coat. This is a grayish substance which contains no red globules, and rises to the surface as the blood coagulates. It is sometimes cupped or depressed in the centre, and, except in pregnancy, it rarely occurs unless in inflammatory affections.

Nature of Inflammation.—Before proceeding with the consideration of this subject, I beg leave to direct your attention to the blood, the capillaries, and nerves, as they are the active agents in the production of this common but dangerous affection. When blood, after leaving a vein, coagulates, it is found to contain both a fluid and solid portion. The first is called serum, and the latter crassamentum. The crassamentum consists of a pale, transparent fluid, called liquor sanguinis, plasma, or coagulable lymph, which contains both red and white globules. The red are about $\frac{1}{3000}$ of an inch in diameter, and the white are not only larger, but are also more adhesive, circulating more slowly and nearer the walls of the vessels.

The Capillaries.—These are the minute vessels which intervene between the arteries and veins. Some of them are sufficiently large to allow red blood to pass through them readily, while from others it is entirely excluded, except when the part is inflamed. These vessels perform a very important part, both in secretion and nutrition.

It may not be uninteresting to you to know the opinions upon the nature of inflammation held by Boerhaave, Vacca, Hoffman, Cullen, and Hunter, men who immortalized themselves by their genius and research.

The first theory advanced was that the capillary vessels became obstructed, whilst the *vis a tergo* remained the same, and that it might depend upon the following causes: 1. Morbid lentor of the

blood; 2. Error loci of the globules; 3. Spasm of the extreme vessels. It is now, however, well known that the blood is not more viscid, and that it coagulates more slowly in inflammation than in a state of perfect health. The free communication by anastomosis would prevent any serious disturbance resulting from misplaced globules. Vacca thought that a debility of the capillary vessels would produce all the symptoms that are presented, even in cases of an aggravated character.

John Hunter believed that the action of the vessels was increased, in which he was unquestionably correct, for they are not only increased but altered.

The first link in the chain of this complicated process is the impression made on the nerves by which the part is supplied. *Ubi irritatio ibi fluxus* is an old and true adage. The part being irritated, an increased quantity of blood is thrown into the vessels, which enlarge, and the circulation continues to increase until they become so distended that they lose all control over their contents, and finally become entirely obstructed. The white globules are thought to perform a very active part in producing this result. They are more adhesive, move more slowly, are larger than the red globules, and, no doubt, are mainly instrumental in rendering the vessels impervious. When the blood ceases to circulate through the vessels, disorganization commences. Fatty degeneration, indicated by the presence of oil-globules, is then observed, and very soon the coagulable lymph previously effused is converted into pus; the surrounding parts, by the pressure it exerts, are absorbed to make room for its accommodation, and an abscess is produced, which is only one of the results of inflammation.

The remainder, with the terminations, will be considered in a subsequent lecture.

LECTURE III.

GENTLEMEN: In my last lecture I endeavored to describe the causes, nature, and symptoms of inflammation; to-day I will enumerate the remedies by which it may either be prevented or controlled.

It is always better to prevent a disease than to cure it after it has supervened. The preventive treatment will first be considered.

Should a foreign body, as a piece of metal, be imbedded in the cornea or sclerotic membranes, or find its way between the lids and conjunctiva, if allowed to remain, inflammation must result. The first indication, therefore, is to remove the cause, and generally the effect will subside.

Should there be drawn into the trachea by a violent inspiratory effort a button or other substance, which can neither be dissolved nor softened by the humidity and warmth naturally existing in all the internal cavities, if it is allowed to remain, violent inflammation must result, and death from either acute inflammation or disorganization of the mucous membrane necessarily occurs.

The same consequences should be expected from the presence of a foreign body in the urinary or gall bladder, and a similar treatment is indicated. Besides removing the cause it sometimes becomes necessary to prescribe rest, low diet, laxatives, anodynes, and especially cold applications. After severe injuries they are all indispensably necessary. Sometimes it is sufficient to apply lint wet with cold water, which should be frequently renewed. In injuries of a more severe character, however, it becomes necessary to apply cold water constantly, and if that is not sufficient to prevent or subdue the increased arterial action, then ice may be added. It is seldom that an injury is so violent, or the tendency to increased arterial action resulting from it so great, as to resist the application even of cold water without the addition of either ice or other substances calculated to diminish the temperature; in proof of which I will mention two cases that have occurred recently in this city. The first officer of the Oakland ferry-boat had his foot caught near the

centre in a coil of the hawser, and it was torn off. The integument and bones yielded readily, but the tendons were torn out with more or less of the muscular tissue with which they were connected, and it is needless for me to say that such an injury was exceedingly severe. Being sent to my private hospital, beside the use of anodynes, rest, and laxatives, the limb was placed in an easy position, and kept cool by the frequent application of water. In ten days not the slightest inflammation existed, and not a particle of pus had been secreted. Poultices were then applied, and in four or five days granulations appeared, the stump began to suppurate, and the spiculæ of bone, which rendered the surface of the wound irregular, were then removed.

In six weeks after the occurrence of the accident, which it was supposed would result at least in a loss of the limb, he walked into my office with a boot on what remained of his foot, and was scarcely lame.

Case 2d. One of our United States Senators was thrown from a buggy, and the tibia of the right leg was fractured above the ankle. The fibula was dislocated, and the extremity protruded through a wound at least three inches in length. Several physicians being present, immediate amputation was urged. Guided by former experience, I determined to make an effort to save the limb. The dislocation was reduced and the leg placed upon Roe's double inclined plane, which had been well padded with cotton, for the purpose of preventing unequal pressure and subsequent ulceration. Cold irrigation was kept up for ten days, and the sulphate of morphia administered to relieve pain. At the expiration of that time the water dressing was substituted. In forty days the wound had healed, the motion of the joint was preserved, and he was able to visit Sacramento to conduct a law case before the Supreme Court of the State. He now experiences no inconvenience from the injury. Cold water was applied until the time for inflammation to occur had passed. Then the water dressing was substituted for the purpose of promoting the granulation and cicatrization of the wound.

Other cases might be adduced, but these are all that I consider necessary to establish the beneficial influence of cold irrigation as a preventive of inflammation after violent injuries.

The great desideratum in the treatment of inflammation is to cause

it to terminate by resolution, or without leaving any change either in the structure or appearance of the part inflamed.

The first thing to be taken into consideration is the cause. When that cannot be removed, or its removal does not give relief, then other remedies must be applied, the most prompt, powerful, and efficient of which is the abstraction of blood. Bloodletting may be either general or local. Formerly a great deal more blood was drawn in acute inflammation than at present, which can only be explained by taking into consideration the fact that physicians had then no other means by which the action of the heart could be controlled.

Then bloodletting may have been too frequently resorted to, but now I am satisfied that the use of the lancet is too much neglected. I believe that many patients have died who might have been relieved by bloodletting; and those who escaped death are left with some organic disease which would not have existed if the inflammation had been controlled by bloodletting before organic lesions resulted.

I have always been an advocate of the lancet. Formerly I bled, it is true, more than at present, because it was then necessary to rely almost if not entirely upon the lancet; but now we have other means by which arterial action can be controlled more effectually. Still these remedies do not relieve the capillary vessels so completely as venesection.

Nearly all writers caution us against bleeding children, women, and old people. I am, however, satisfied that so far as women and children are concerned there is no danger. I have bled children at all ages, and a month has not elapsed since I took eight ounces of blood from a child six months old who had convulsions produced by ligating a large nævus on the neck. The child was relieved, and convalesced as rapidly as any I have ever treated. I always bleed children in convulsions when they occur during the acute stage of disease, because bloodletting relieves the capillaries of the brain, and prevents the consequences which might otherwise result.

When inflammation is accompanied by fever of a sthenic character, with a full, strong, and frequent pulse, together with increased heat, thirst, and indeed, with all the symptoms resulting from increased arterial action, then the lancet should be used.

It is important when you resort to venesection that the greatest

possible effect should be produced by letting the smallest quantity of blood. It is easy to remove blood but very difficult to restore it. Even if the patient be strong and vigorous, it is desirable that this rule should be observed; for that reason you should always place the patient in a semi-erect position, and open a large vein to allow the blood to flow in a full stream. This will produce the desired effect more certainly and speedily than if the blood should flow with less rapidity. You are advised by all writers to open the median basilic in preference to any other vein. That is directly over the brachial artery, and I think it is much better to open a vein on the radial side of the tendon of the biceps. There you can do no harm, and serious consequences might result from opening the vein usually selected. I always feel for the artery, and open a vein which does not lie directly over it, otherwise you subject the patient to the danger resulting from a varicose aneurism. What effect should you expect from venesection? The pulse becomes more feeble and less frequent, the face becomes pale, sickness is usually complained of, and if the patient is not speedily placed in a recumbent position, syncope will ensue. That should, if possible, be avoided, because when it follows the abstraction of blood the reaction is usually very violent, and if proper precautions are not taken it might prove fatal. You should, therefore, so soon as sickness occurs, and the face becomes pale, and perspiration appears on the forehead, remove the pillows, and place the patient in a recumbent position. Sprinkle the face with cold water, and very soon the faintness will disappear.

Bloodletting not only subdues or controls acute inflammation, but also prevents congestion and chronic inflammation of the organ affected, which results in many cases where such means are neglected.

In some cases bloodletting can be dispensed with, but in others it is indispensable, as in gonorrhœal, purulent, or acute ophthalmia; it is impossible to control the disease by the ordinary remedies, and as disorganization frequently occurs in twenty-four hours, the most prompt and energetic treatment should be adopted. Why do you see so many blind persons in the streets of every city? Because acute inflammation of this organ is frequently treated by the application of poultices, alum curd, and other remedies equally inefficient, until the cornea ulcerates, the humors escape, and the disease has passed beyond the reach of the most skilful treatment. The cases in which bloodletting is especially required will be specified when

the diseases of the various tissues and organs of the body are considered.

Bloodletting includes venesection or the opening of a vein, and arteriotomy or the division of an artery. There is but one artery that it is ever necessary or proper to open, and that is the temporal. In cases of acute ophthalmia, I frequently divide the anterior branches of that artery instead of resorting to venesection. In inflammation of the brain, after venesection, arteriotomy should be performed, and if the hæmorrhage be troublesome or an aneurism forms, then the vessel should be divided transversely, and the bleeding arrested by the application of a compress and bandage. Local bleeding includes cupping, leeching, punctures, and incisions. All these methods of abstracting blood are sometimes exceedingly useful. When any of the abdominal organs are inflamed, leeching should be performed, because it is less powerful than cupping and equally as efficient; but in pulmonary inflammation, cups are preferable, not only because as much blood can be abstracted as may be necessary, but also in consequence of the great benefit derived from the counter-irritation inseparable from their application.

Punctures are frequently resorted to for the purpose of removing blood locally, and particularly in orchitis, and is especially necessary when the inflammation is accompanied by an effusion between the testicle and tunica vaginalis. You not only abstract blood but remove the pain resulting from the pressure produced by the presence of serum.

It is seldom necessary to apply leeches to the scrotum, since any quantity of blood can be removed by puncture, which is more expeditious and less expensive than leeching. Punctures are useful in other cases. Suppose, for example, the hand be violently and extensively inflamed as the result of an injury. Instead of opening a vein, numerous punctures should be made in the direction of the limb, avoiding the large veins; this will relieve the capillaries more effectually and speedily than could be done by the application of leeches.

Incisions are useful and indeed indispensable in periostitis. If this be neglected when the bones of the hand are diseased, the inflammation frequently extends up the arm in the direction of the tendons, implicating the surrounding cellular tissue, and cannot be arrested by any other treatment. Whenever the periosteum is in-

flamed, no matter whether the bone it covers be small or large, a free incision should be made, and if practiced before it is detached and the bone denuded, immediate relief will be afforded. Although bloodletting is very important in the treatment of inflammation, you must not suppose that either it or all the other remedies which will be hereafter enumerated will be required in every case of inflammation, as it very frequently will disappear under the influence of rest, cathartics, and cold applications.

The next class of remedies to which I shall allude is cathartics; first to those which simply evacuate the intestinal canal, which is exceedingly important in the management of every case. They are called laxatives, and include ext. juglandis, ol. ricini, rhubarb, aloes, ox-gall, etc. The latter removes the contents of the alimentary canal more effectually probably than any of those enumerated, without producing either much pain or inconvenience by its action.

2d. When it is desirable to increase the serous secretion of the intestinal mucous membrane, as in dysentery accompanied with fever, and the discharge of mucus with indurated and offensive fecal matter, then citrate of magnesia, Epsom salts, and saline cathartics generally, or the latter combined with senna, will be found most useful.

3d. When it becomes necessary to increase or change the secretion, either of the liver or other abdominal organs, which will be frequently required in malarious districts of country, the most useful for that purpose are blue mass, hyd. cum creta, calomel, fluid ext. sennæ, and above all the ext. juglandis, as cathartics. The last named has been too much neglected, for if taken in a dose of twenty grains at night, it will produce two or three bilious discharges in the morning; and in combination with aloes, it is the only laxative I employ, except the fluid ext. sennæ in constipation accompanying indigestion.

4th. They act by revulsion, and are exceedingly important in the treatment of ascites, and particularly in acute affections of the supra-diaphragmatic organs. They act on the principle of revulsion or counter-irritation. Of this class, the following are the most useful: comp. ext. colocynth, in large doses, ol. tiglii, scammony, gamboge, podophyllin, saline cathartics, and above all the ext. elaterii comp. This should be given in doses of one-quarter of a grain every two hours until a decided effect is produced. It increases the serous secretion of the alimentary canal more than any other article of the

Materia Medica, and consequently is the most powerful revulsive and counter-irritant.

Emetics are seldom used in inflammation, being generally inapplicable except in affections of the throat, lungs, and testicles. In surgery they are seldom prescribed unless it be in orchitis, and in that difficulty they are invaluable. Depressants diminish the action of the heart and increase the secretions, and consequently, are exceedingly valuable in the treatment of inflammation.

The most active and reliable are:

1. Fluid ext. veratrum viride.
2. Tinct. aconiti rad.
3. Antimon. tartarizatum.
4. Rad. ipecacuanhæ.
5. Pot. nitrate.

Physicians differ in opinion in reference to the relative value of depressants. Professor Gross thinks that tartar emetic stands at the head of the remedies known to exert that influence. I am sorry to differ with so eminent a surgeon upon any subject, but I think really that there is no comparison between that remedy and either veratrum or aconite. Without distressing nausea, the effect of tartar emetic is uncertain, but the veratrum, even in moderate doses, never disappoints. I believe that the nitrate of potash and aconite are both very useful as general remedies, there being few who are willing to submit for an indefinite period to the nausea resulting from the use of either ipecac or tartar emetic. Should sickness of the stomach result from large doses of the veratrum viride, it, with the prostrating effect of the remedy, will yield readily to the action of any alcoholic stimulant. We should not rely, however, upon any one article of the Materia Medica in the treatment of diseases so violent as to require the use of powerful depressants. The effect can be increased and rendered more certain by a combination of these remedies. The following is the most powerful, and at the same time the most generally applicable I have ever administered:

℞.—Pot. Nitrat., ... ʒiij.
Tinct. Aconiti Rad.,
Ext. Verat. Virid., ... ʒi.
Syr. Scillæ,
" " Compositi, āā . . . ℥ij.
M. Give one teaspoonful every two hours.

This will almost always control the most violent arterial action within six hours. The pulse becomes slow, the respiration natural, and the temperature diminished; and it is probably the most valuable adjuvant to bloodletting that can be administered. When it becomes necessary to relieve pain, it is much better to administer the anodyne separately, and as occasion may require, than to combine it with this or any other combination of depressants.

Diaphoretics, to use the language of Professor Gross, bear the same relation to the skin that cathartics do to the bowels. The amount of fluid secreted by the skin is from twelve to sixteen ounces daily, which shows the necessity of attending particularly to this important emunctory in the treatment of every disease. Of this class of remedies only a few are decidedly useful.

1. Ant. tart.
2. R. ipecac.
3. Spts. mindereri.
4. Dover's powder and other combinations with opium.
5. Cold water.
6. Warm drinks.
7. Steam and hot bottles.

Tartar emetic is certainly one of the most valuable diaphoretics, and in combination with opium, its effect upon the skin is more certain than when administered alone. The next in importance as a diaphoretic is ipecac. It is very useful, particularly in diseases of children, either alone or when combined with opium in the compound known as Dover's powder. I prefer to Dover's powder for adults a combination of opium, ipecac, and aloes. It can be administered in pills. It is less unpleasant to the taste, is not so liable to nauseate, and does not produce constipation; *e. g.*,

℞.—Gum Opii,
Pulv. Rad. Ipecac.,
Gum. Aloes S., āā . . . . . gr. x.
M. Fiat pil. No. xx.

Two may be given at night, or one three or four times a day, as may be required, either to relieve pain or act as a diaphoretic. Spts. of mindererus or liquor am. acetatis is an exceedingly valuable stimulating diaphoretic in asthenic forms of fever, whether traumatic or idiopathic. In typhoid fever, a tablespoonful, in combination

with five drops of the tinct. of nux vomica every three hours, is one of the most valuable remedies that can be prescribed. It should be in such cases continued so long as diaphoretics and tonics are required.

The next diaphoretic to which I will call your attention is cold water. Very frequently a free draught of cold water will act promptly and effectually as a diaphoretic. In fever resulting from cold, if the patient is put to bed, covered with blankets, and allowed to drink freely of ice-water, very frequently the skin becomes moist, the fever will subside, and the effect will be equal to that produced by warm drinks, and much more agreeable to the patient.

We are all familiar with the effect of hot drinks if administered when the patient is covered warmly in bed; their action is greatly increased by the assistance of steam, which may be obtained and applied by covering with heavy blankets a patient who is placed on a cane-seat chair over a tub of hot water. I have frequently in intermittent fever prevented a paroxysm, by surrounding a patient, an hour before its expected advent, with a dozen ears of Indian corn taken from boiling water. The steam arising from the corn produces perspiration speedily and abundantly, and it is preferable to anything else that can be employed for that purpose.

Both hot drinks and external heat are exceedingly valuable when either the extremities are cold, or there is a deficiency of arterial action.

Diuretics are administered to restore or increase the urinary secretion. They are a very important class of remedies. They act differently upon the urinary organs, and are not all applicable to the same cases.

Squills, colchicum, and digitalis increase the urinary secretion, and promote the absorption of serum, effused either in the cavities or cellular tissue; consequently they are indispensable in the treatment of dropsy, especially if it depend on disease of the heart. In doses of ten drops every three hours, the tinct. of digitalis, combined with nitrate of pot. and syr. scillæ, will remove a dropsical effusion speedily, unless it should result from organic disease of the liver or kidneys, and then all remedies fail.

The nitrate, acetate, carbonate, and bitartrate of potassa, restore the secretion of urine, increase its quantity, and frequently allay irritation of the urinary organs. They are, however, inferior in that

respect to copaiba, cubebs, buchu, and uva ursi. They increase the secretion to some extent, and at the same time allay irritation of the mucous membrane of the bladder and urethra, and when the diseases to which these remedies are applicable shall be under consideration, the mode of administration and the peculiarities of their action will be specified.

Anodynes.—The success of the surgeon depends more upon a knowledge of the virtue of this class of remedies than upon everything else combined. They should follow depletion, and be given in doses sufficiently large to produce the desired effect. Indeed, a patient should not be allowed to pass a restless night. He can be rendered quiet and relieved of pain, even if sleep cannot be produced, by the administration of a suitable dose of opium or some of its preparations. Four grains of opium or one grain of morphine may be given with perfect safety in twenty-four hours. One of the best preparations of opium is McMunn's elixir, in doses of from twenty to thirty drops. It does not constipate the bowels as much as the other preparations, and is applicable to every case in which opiates are indicated. In cases of idiosyncrasy in which it is impossible to take opium without inconvenience, I have found codeia superior to any other narcotic. It is prepared from the poppy, and is objectionable only on account of its cost.

If codeia cannot be obtained, or fails to produce the desired effect, give hyd. of chloral, and should that fail, the endermic or hypodermic effect of morphine should be secured. Morphine may be applied in one-grain doses to a denuded surface, or a solution may be thrown into the subcutaneous cellular tissue, with the most happy result; and in cases of idiosyncrasy, the unpleasant effect when taken into the stomach is not experienced. The cuticle may be removed in a few minutes by the application of ammonia, and the effect of the morphine is secured as speedily and satisfactorily as if no such peculiarity existed.

Aconite, cannabis indica, hyoscyamus, lupulin, and other articles have been substituted for opium, but I have always been disappointed in their effect, and I now seldom prescribe them as narcotics.

LECTURE IV.

GENTLEMEN: In my last lecture I mentioned calomel only as a useful cathartic, but it deserves separate consideration in consequence of its extraordinary efficacy in inflammation, particularly when the violence of the disease has been diminished by the remedies which have already been enumerated.

In acute inflammation, after local and general bleeding, should they be considered necessary, and the exhibition of an active cathartic, of which calomel may be one of the ingredients, and the use of the combination of depressants already given, should the inflammation still continue, then I advise you to resort to calomel. It is impossible to determine its *modus operandi*, but it is well known that it exerts a more powerful influence over local inflammation than all other remedies combined, particularly when administered with opium in a sufficient quantity to relieve pain until its effect can be obtained, and together with the depressants previously enumerated when increased arterial action exists.

In pneumonia the following prescription is superior to anything I have ever prescribed:

℞.—Hyd. Submur ,
Gum. Opii, āā . . . . . gr. viij.
Ext. Aconiti Rad., ... gr. xij.
Ant. Tart., ... gr. ij.
M. Fiat pil. No xvi. Sig. Give one pill every three hours.

This combination, when alternated with the extract of veratrum viride, controls increased arterial action, allays irritation, checks the cough, which is always distressing, and moreover exerts a decided influence over the local difficulty. The same treatment will be found extremely valuable in pericarditis, which, if not speedily controlled, will result in effusion, and which, if not properly treated, may terminate fatally.

In acute ophthalmia, when so violent as to produce disorganization, there is no substitute for this. If the pain be violent, combine

it with opium. If the arterial action be increased give at the same time the veratrum viride and aconite. The veratrum cannot be combined with it, but may be administered separately and alternately. Norwood's and Thayer's fluid extract are both reliable. Two drops every two or three hours, combined with the articles previously mentioned, will in six or eight hours reduce the pulse to its natural standard. The only unpleasant effect that should be apprehended is distressing nausea or a sense of constriction of the pharynx, which is more unpleasant than dangerous, and yields readily to a glass of brandy or any other alcoholic stimulant. When that symptom appears the dose should be diminished. Calomel unquestionably is a powerful remedy and should be cautiously prescribed, since nothing is more injurious to a young physician than to salivate patients badly, as neither they nor their friends understand the necessity for such treatment, and the physician may in consequence become exceedingly but not always deservedly unpopular.

When its administration becomes necessary, always watch the case closely; examine the mouth at least twice every day and particularly the breath, for that frequently emits the mercurial odor before the gums become affected. A copperish taste is sometimes complained of before tumefaction of the mucous membrane occurs, or the action of the salivary glands is increased.

When this result is attained, the remedy, having accomplished all that can be expected, should be abandoned.

Regimen.—In the treatment of acute inflammation, a proper regimen is indispensable. The lowest diet that can be prescribed is arrowroot, which is, however, often given to children who require the most nutritious food. In such cases, when its use has been continued for three or four weeks, the patient becomes so pale as to be almost transparent, and is so much enfeebled as to be unable to resist the violence of acute disease.

There are other articles that are equally simple but much more nutritious, such as sago, tapioca, as well as gum arabic, barley, rice, and toast-water. They may be prescribed in any case, even when ordinary nutriment cannot be retained.

In acute inflammation but little nourishment should be taken. This regimen should not, however, be continued too long. So soon as the appetite returns something more nutritious should be allowed, which will be mentioned when chronic inflammation is considered.

In such cases change of position is exceedingly important, and should be as frequent as may be compatible with the comfort of the patient.

Local Treatment.—The first and most important indication is to remove the cause. If an eye be inflamed the light should be carefully excluded. If a joint be injured it should be kept at rest, as anchylosis frequently results from injuries in consequence of that precaution being neglected.

Local Bloodletting.—The next remedy in importance is local bloodletting, which may be accomplished either by scarifying, puncturing, leeching or cupping. The method to be adopted should depend on the position of the part affected.

In orchitis I prefer puncturing. Never apply an irritant to an inflamed surface, as ulceration may be produced or the character of the inflammation may be changed. Cups should not be applied to a part that is usually exposed. If it be considered necessary to abstract blood by them from the temple, the hair should be shaved off, and the scarificator applied where the scars will not be visible. A leech leaves a permanent cicatrix; therefore, particularly in females, never apply them to the face, temples, or any exposed portion of the body.

Local bleeding, as before mentioned, should usually be preceded by general bloodletting. As the method best adapted to particular cases was considered in my last lecture, it will not be repeated.

Another very important remedy in inflammation is cold irrigation; and it only remains for me to describe a simple method for obtaining the full effect of that remedy. A large-mouthed bottle filled with cold water in which candle-wicking has been placed, and so arranged as to act as a siphon, may be suspended over the part inflamed, which should be well protected by porous cloth or lint, and the water allowed to drop either occasionally or constantly, as may be necessary, to remove the increased heat, pain, and redness that may exist. The part should be exposed, to favor evaporation; otherwise the effect will be similar to that of a poultice, and the object defeated by the exclusion of the atmosphere. Cold water may be either applied alone or combined with alcohol. Six parts of the former and one of the latter should be applied as before stated occasionally, or allowed to drop slowly upon the part inflamed, according to the effect desired. The quantity may be easily regulated by the size of

the siphon employed. Should the inflammation be so violent that some more active application becomes necessary to reduce or diminish the temperature, then ice, or a combination of salt and ice, may be added to the water.

In inflammation of the brain the most convenient method of obtaining the full effect of this remedy, is to put pounded ice either into a bladder or gum-elastic bag, and keep it constantly applied with the intervention of a folded towel, until the disease is either controlled or is no longer amenable to treatment. The pulse can be reduced both in force and frequency by the application of ice or iced water to the head more speedily than by the administration of the depressants heretofore mentioned. When irrigation is not required, I have found the following sedative exceedingly useful:

Tinct. Arnicæ, ...	℥iv.
Tinct. Opii, ...	℥ij.
Plumbi Acetatis, ...	℥ss.

M. Sig. For external use, diluted.

Put into a quart of water and apply by saturating three or four double of lint or porous cloth with the mixture; and evaporation is prevented by covering it closely with oiled silk. This application should be renewed two or three times in twenty-four hours, and continued so long as may be necessary. Erichsen recommends that ℥ij of the tinct. of arnica be combined with a pint of water, and applied, either with or without the oiled silk, as may be considered most advisable under the circumstances.

Fomentations.—Cloths wrung out of hot water, a decoction of chamomile flowers, poppy-heads, or hops, or bags containing the articles mentioned, when dipped in hot water and applied, particularly to the chest and abdomen, if protected by oiled silk and secured by a bandage, will be found exceedingly useful in gastritis, peritonitis, pneumonia, and particularly in pleurisy.

Steeping is a variety of fomentation which is very useful in some cases of inflammation, and particularly when located upon the face or head; tow, lint, flannel or soft porous cloth, should be kept wet with warm water and applied to the part affected, so long as may be necessary. Steam may be applied to any part of the body by a gutta-percha tube attached to the spout of a coffee-pot or kettle, which contains hot water. A very convenient method of applying

steam, either to the eyes or ears, is by inverting a funnel over hot water, and directing it to the part affected, the head being at the same time covered with a towel to prevent the escape of the vapor. In inflammation of the ear, which is the most painful variety of inflammation, relief is generally afforded in fifteen or twenty minutes; but should it fail, a few drops of vin. opii, digitalis, and glycerin should be introduced, and warm-water dressing applied:

℞ —Vin Opii,
Tinct. Fol. Digit., āā . . . . . ʒij.
Glycerinæ, ... ʒiv.
M. Sig. Apply as directed.

The next local remedy to which I will refer is the cataplasm or poultice, which although in many cases very useful, is greatly abused. A poultice should never be applied until suppuration is threatened, and then I usually prefer the warm-water dressing, introduced by Mr. William Liston, of England. When properly applied it has the same effect, is much more convenient, and much less filthy and disagreeable than poultices. All that is necessary to enable you to obtain the full effect of that remedy, is to apply to the part affected four or five double of lint or old porous cloth saturated with warm water, cover it with oiled silk, and secure it by a bandage so perfectly as to prevent evaporation. The virtue of every variety of poultice depends on the heat and moisture it contains, and the warm-water dressing combines both as perfectly as any poultice. If the lint be kept wet, and the heat retained, the effect will be secured.

The warm-water dressing or poultice should not be continued until the part becomes sodden; or, in other words, until the skin becomes thickened and irritable, for then it is always decidedly injurious. The articles generally used for poultices, and which are found most useful, are corn-meal, bread and milk, arrowroot, turnips, carrots, potatoes, flaxseed meal, and slippery elm bark. With warm water you can make a poultice of anything that will retain heat and moisture. It should be sufficiently soft to be easily spread upon a cloth. The flaxseed and slippery-elm poultices adhere at the edges to the skin, and remain moist longer than those made of any other substance. Any poultice may, however, be kept moist by covering it with oiled silk. It was formerly believed that charcoal possessed extraordinary efficacy when gangrene was threatened. It is now

seldom used, but if it be indicated, it should be combined with corn-meal and warm water in such quantities as to give it the proper consistency. I do not believe that it is particularly efficacious, and it is objectionable in consequence of the difficulty experienced in removing it after it has been applied.

Yeast poultices are very convenient when a tendency to gangrene exists. They should be prepared by combining the yeast either with ground flaxseed or slippery elm bark, and should be removed two or three times in twenty-four hours. A very important remedy in the treatment of inflammation is the nitrate of silver. Although I do not entertain an exalted opinion of its efficacy in all the diseases in which it is recommended, yet in ophthalmia, ulcerations of the throat, and other local difficulties it is invaluable. Always use the stick to an ulcerated surface, particularly when irritable, because the pain is relieved by the application.

When an ulcer is disposed to cicatrize, and the granulations rise above the surrounding integument, the edges should be touched every alternate day with the nitrate of silver. I followed the physician of a public hospital in this city, for a short time, who carried a stick of nitrate of silver in his hand, whilst making his visits, and cauterized every ulcer in the wards of the hospital whether above, below, or on a level with the integument. Instead of healing, they were all soon converted into callous ulcers, which required warm applications and pressure to enable them to granulate and cicatrize. In herpes, erythema, and erysipelas, twenty grains of the nitrate of silver to the ounce of distilled water is frequently prescribed as a local remedy, yet, even in these affections, I prefer the compound tincture of iodine to anything I have ever employed.

When vesication is not desirable, I combine it with an equal quantity of the tincture of arnica. It should be applied with a camel's-hair pencil three or four times a day, and you will seldom be disappointed with the effect.

Iodine has been recommended in affections of the eyes and throat, but having no experience in its use, I can recommend other means with more confidence. When applied to an ulcerated surface, it should be only one-fourth the strength of the alcoholic tincture, and then it may be applied either to the eye, throat, or even to a denuded surface without producing excessive pain.

Destructives are employed to destroy the germ of disease, as in hydrophobia, malignant pustule, and chancre. I have never, except in the Hôtel Dieu in Paris, seen a case of malignant pustule, and there the actual cautery was applied and its progress invariably arrested. In the treatment of chancre I have had an extensive experience, and now seldom apply any destructive except nitric acid. I prefer it either to the acid nitrate of mercury or the solution of corrosive sublimate. It should be applied with a small piece of wood, the size and shape of an ordinary lead-pencil, and its action should be limited either by the application of water or the supercarbonate of soda in two or three minutes after it has been applied, according to the greater or less effect desired.

Irritable ulcers, whether they be simple or specific, when painful, are relieved more speedily by the application of nitric acid than by any other remedy I have ever employed.

Counter-irritants include rubefacients, vesicants, and suppurants. The first only irritate the skin, as alcohol, vinegar, ammonia, camphor, and mustard. When a decided and speedy effect is desired, mustard should be preferred. When mixed with water it acts more speedily, and a thin cloth should be placed between it and the skin, so that it can be readily removed when the desired effect has been produced.

The other rubefacients mentioned may be applied either with or without friction, and should be continued until the skin becomes red, and then the increased vascularity may be rendered permanent by the warm-water dressing or vinegar, which is preferable to water, because it irritates but rarely vesicates the part to which it has been applied.

Vesicants.—The most efficacious and convenient vesicants are ammonia and cantharides. The former acts most speedily, and when the endermic use of morphia is necessary, it should be preferred. A blister can be drawn in a few minutes by applying four or five double of paper wet with strong spirits of ammonia, which should be covered with oiled silk to protect the thumb, with which it should be held firmly in contact with the skin until vesication is produced. So soon as the cuticle is detached, half a grain of the sulphate of morphia should be applied, and retained by the application of a fold of wet printers' paper. Cantharides are usually employed when it is not necessary to vesicate the part so speedily.

Birt's blistering fluid is superior to any other preparation. Strangury seldom results from this application, an accident which is usually the most distressing consequence to be apprehended from an ordinary blister, and one which when it occurs, is more painful than the disease for which it has been applied. When that preparation cannot be obtained, either the common blistering ointment or tissue-paper may be substituted. They should be allowed to remain five or six hours, and when removed the water-dressing should be applied, and continued until the discharge from the irritated surface subsides. There are other local remedies which you may find it necessary to employ.

Issues may be established by making an incision about an inch in length, in which two or three issue peas should be inserted, and retained by a compress and bandage. Formerly they were more popular than at present, although they are unquestionably much more efficacious than some of the counter-irritants which have been substituted for them.

I have seen great relief afforded by them in chronic affections of the viscera, both of the thorax and abdomen.

A more common and fashionable remedy in chronic inflammation is the seton, but at the same time it is more painful, more troublesome, and decidedly more unpleasant, because it is impossible, without changing the cord frequently, to keep it sufficiently clean to prevent it becoming offensive.

A seton is inserted by passing through an elevated portion of the skin, a seton-needle, either with a skein of silk, a strip of cotton cloth, or tape, as may be preferred, and it should be allowed to remain until the desired effect is produced.

After the introduction of the seton, the warm-water dressing should be applied until suppuration is established, and then simple cerate may be substituted. The diseases to which this is especially applicable will be specified when under consideration.

One of the most valuable suppurants is ol. tiglii. It has almost supplanted, if I may use the expression, both setons and issues. Should croton oil lose its efficacy by repetition, all that is necessary is to combine it with tart. antimon., ʒj of each to half an ounce of lard, to produce the same effect. Croton oil is my favorite counter-irritant, particularly when a suppurant is required. Before it is applied, the skin should be rubbed briskly with coarse paper, until

considerably irritated, and this repeated after the application of twenty or thirty drops of the oil. One application usually produces sufficient irritation, and should the pustulated surface become very painful, it may be dressed either with mutton suet or warm water, as may be most convenient.

LECTURE V.

A FEW days since I opened an abscess of the liver which had been about four months in forming. The patient was, at the time of the inception of the disease, in a tropical climate. He there contracted intermittent fever, which apparently yielded to the ordinary remedies; but he did not regain his health, and after returning to this city he discovered some enlargement of the left side, which ultimately acquired such magnitude as to be exceedingly inconvenient. In order to afford relief, an incision was made with a scalpel, and two quarts of pus escaped. In that case, chronic inflammation resulted in suppuration. Ulceration may also occur, as in chronic gastritis, accompanied with dyspeptic symptoms. When this disease is located in the intestinal mucous membrane, ulceration frequently takes place, which is true of the cornea as well, in chronic ophthalmia. Adhesions are also very common in chronic pleuritis, in which the pleura costalis and pulmonalis become united, and the pleural cavity is obliterated.

Induration also results frequently from this form of inflammation. To illustrate, induration or enlargement of the lymphatic ganglia of the neck or groin may be specified. The part inflamed increases gradually in size until it attains a certain magnitude; it then becomes solid, and is frequently stationary, and then you have both induration and enlargement. You have all seen, in the surgical ward of the hospital, a man who has a testicle which is enlarged, indurated, and suppurating, which is proof conclusive that chronic inflammation may result in induration, enlargement, and suppuration, and also that they may all occur in the same case. This is frequently observed in scrofulous subjects. The epididymis becomes enlarged and almost as solid as bone. Your attention was directed to two cases of that character in the hospital.

Treatment.—In chronic inflammation the first indication is to remove the cause, and then the effect, should the latter still remain. The diseases which result from chronic inflammation are so difficult to treat that few surgeons acquire a reputation for their successful

management. The success in such cases depends upon counter-irritation, and the proper use of the remedies calculated to improve the general health. When chronic succeeds acute inflammation, the opinion already expressed in reference to the use of calomel is applicable to the disease now under consideration, unless it be of a scrofulous character, and in such cases it is always injurious and may be highly dangerous. Should the difficulty be of a specific character, then remedies should be administered which are calculated to control that peculiar affection, and very soon, if particular attention be paid to diet and regimen, it will disappear.

Should chronic inflammation of the lymphatic ganglia exist when the scrofulous diathesis is well defined, then you should administer the iodide of potassium in combination with the fluid extract of stillingia, according to the following formula:

℞.—Pot. Iodid., ... ʒiv.
Ext. Still. Syl. Fl., ... ℥iij.
Tinct. Aconiti Rad., ... ʒij.
Syr. Zingiberis,
Syr. Simplicis, āā . . . . . ℥ij.
M. Sig. Take one teaspoonful three times a day.

The iodide of iron is exceedingly useful in some cases of this character, and the most convenient form of administration is that of Blancard's pills. One should be taken three times a day, which when combined with generous diet and sufficient exercise to secure perfect digestion, will generally relieve the difficulty under consideration. In cases of scrofulous ophthalmia accompanied with excessive photophobia, the general health will improve, and the local difficulty subside more rapidly by the use of the following prescription than by any combination of remedies I have ever administered:

℞.—Quin. Sulphatis, ... ʒj.
Pul. Rad. Rhei,
Sang. Canadensis,
Ext. Cicutæ, āā . . . . . ʒss.
M. Fiant pil. No. xxx. Sig. Take one pill four times a day.

During the use of these pills, the local treatment should not be neglected when the diseases of the eye are under consideration. When chronic inflammation exists in any of the abdominal organs,

accompanied with indigestion, constipation, and the debility inseparable from insufficient nutrition, the following mixture will be found invaluable. It is laxative, tonic, and sedative, and fulfils the indication in such cases more perfectly than any other remedy.

℞.—Ext. Sennæ Fl., ... ℥iij.
Tinct. Nucis Vomicæ, ... ʒix.
Tinct. Aconiti Rad.,
Acid. Hydrocyanici, āā . . . . . ʒiss.
Syr Zingiberis,
Syr. Simplicis, āā . . . . . ʒvj.
M. Sig. Take one teaspoonful four times a day in water.

When prescribed for females, ℥ss. more syrup should be added to the other ingredients. I have prescribed this mixture in thousands of cases, and I have never known any unpleasant symptom to result from its use. The fluid extract of senna acts on the liver, and it is the only laxative I have found that does not require to be withheld occasionally, in consequence of acting excessively on the bowels. The tincture of nux vomica is the best tonic that was ever administered. The other ingredients allay irritation and constitute a valuable part of the compound. In cases of anæmia, ʒiv of the precipitated carbonate of iron may be added, and the hydrocyanic acid excluded. You will then have the combination of a laxative with the best mineral and vegetable tonics, which will disappoint as seldom as any other that has ever been administered.

In the treatment of such cases great attention should be paid to diet. Should the constitution of the patient be good, and the chronic affection the result of an improperly treated case of acute inflammation, then a mild, farinaceous, but nutritious diet should be prescribed, such as milk, sago, tapioca, eggs, custard, broth, and articles of that character, in combination with the constitutional treatment previously recommended. When the patient is naturally feeble, or the energy has been impaired by disease, a generous diet should be prescribed. I seldom advise stimulants in such cases, but prefer the remedies which are calculated to restore the secretions of the digestive organs, and allow sufficient nourishment to improve the strength. Give as much beefsteak, mutton, eggs, and cream, as can be digested, and if the digestive organs be deranged, prescribe the remedies already specified; or if acidity of the stomach exists give

the following mixture, which is preferable in such cases to the ordinary alkaline mixtures usually prescribed.

℞.—Acid. Nitrici, ... ʒiv.
Aquæ Destil., ... ℥ivss.
M. Sig. Take one teaspoonful three times a day in a gill of water.

And ten grains of the extract of jug. cathar. may be given at night, should the bowels be constipated.

The treatment of all the diseases which belong to my department will be given hereafter, and I will now direct the attention of the class to the terminations and results of inflammation. Inflammation is generally supposed to terminate in resolution, ulceration, or gangrene. It, however, only terminates,

1st. By delitescence.
2d. Resolution.
3d. Mortification.

This application of the word delitescence was made by the French, and is derived from a Latin word which means to abscond. It is certainly one of the most fortunate terminations of inflammation, and the one we should always endeavor to produce. Should a cold be contracted, accompanied with sore throat, chilliness, and aching of the extremities, with slight fever, all of which are the symptoms that usually precede acute inflammation, in such cases after bathing the feet in warm water, and after the patient is properly covered in bed, administer a pill composed of opium, ipecac, and aloes, of each one grain, and most probably by morning the disease will have absconded. If not entirely removed, however, a repetition of the same remedies the following evening will generally relieve the difficulty entirely.

It is always proper to resort to this treatment even in gout and acute rheumatism, as it affords temporary relief and will not produce a metastasis, or in other words change its location to a more vital part, as would result from the application of a blister in acute articular rheumatism. I have known rheumatic inflammation to be driven from point to point, and ultimately to the heart, by blisters, which was the treatment recommended and generally adopted in such cases when I entered the profession.

Termination by Resolution.—When a part that has been inflamed assumes its natural appearance, then the inflammation is said to ter-

minate by resolution, and this may even occur after the deposition of both serum and purulent matter.

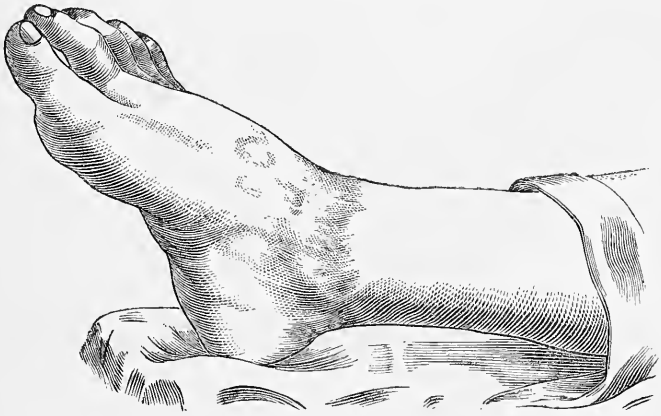
A part may be inflamed, swollen, and indurated, but if proper means are adopted, the enlargement or congestion of the vessels will diminish gradually, and finally disappear. Every effort should be made to secure this termination. When an eye is inflamed, although it may be red and exceedingly painful, yet, under proper treatment, the inflammation will gradually disappear until nothing remains except a few enlarged vessels, which can speedily be removed by the use of a weak solution of the nitrate of silver or the sulph. alumina, five grains to the ℥j of distilled water.

Mortification is the third and last termination of inflammation. This is really a termination, because the life of the part implicated is destroyed. Mortification may be either acute or chronic.

The acute is accompanied by excessive constitutional disturbance even if only a limited portion of the body be involved. The cuts exhibited represent the different stages as the disease progresses.

Fig. 1 represents an inflamed foot before mortification has occurred. Vesicles have made their appearance, which contain a dark-colored

Fig. 1.



serum. The inflammation extends above the ankle-joint, and is most intense at the upper portion of the discolored surface, and if it presents that appearance the part is gangrenous.

Fig. 2 represents the same foot after it has become more dark and

is diminished in size, and when it has reached the second stage, and the circulation has entirely ceased, and the line of demarcation is very distinct.

Fig. 2.

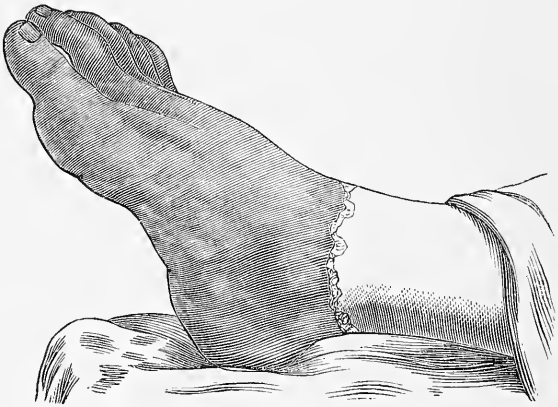
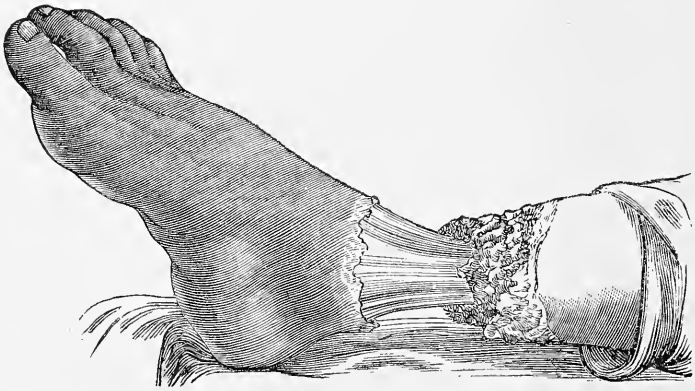


Fig. 3 represents the foot when entirely dead, the living tissues having separated from those deprived of vitality. The bones are

Fig. 3.



denuded and exposed, and the stump presents a healthy granulating surface, which is the appearance that should exist before the foot is removed.

The constitutional symptoms of mortification are more serious than you would suppose could result from the death of so unimportant a part of the body; but a more remarkable peculiarity is that the

patient may be almost *in articulo mortis*, and yet if the part be removed in a few hours the unfavorable symptoms will entirely disappear.

Causes.—Mortification may result from, 1st. Excessive debility, or defective local action. It is well known that paralysis, either general or partial, predisposes to that difficulty, bed-sores occurring in such cases in a few days, if the proper precautions are not taken, in consequence of defective local action; a condition which also exists in ossification, or a deposition of calcareous matter in the arteries, particularly of old men, and which produces dry gangrene, an example of which is well represented by Fig. 4 (page 64).

2d. Excessive irritability or excessive irritation. If a blister be applied to a young child, although it is not allowed to remain more than three or four hours, in a few days inflammation may supervene, and the entire surface become gangrenous in consequence of the excessive irritability of the subject. The same application made to a healthy adult, whether male or female, will merely vesicate, and the irritation will subside in a few days, it being difficult in some cases to keep up a discharge from a blistered surface without the assistance of some irritating application. I therefore repeat the advice given in my introductory lecture, never to blister a child except as a last resort. An illustration of the effect of excessive irritation is exhibited by the crushing of one of the extremities by a force which is sufficiently violent and extensive to destroy the vitality to a considerable extent. If the injured part in such cases be not speedily removed, death will result from the shock inseparable from such an injury.

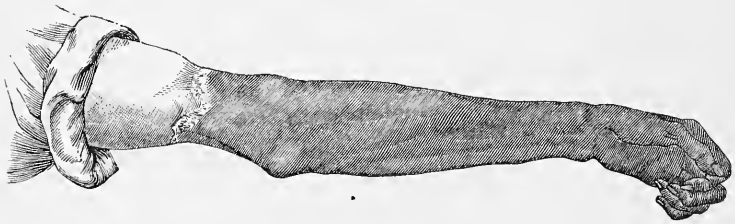
Treatment.—The first indication is to control excessive action; cold irrigation, being the most powerful local remedy in such cases, should not be carelessly employed. The temperature of the part should neither be diminished so much as to endanger its vitality, nor kept in that condition too long. If you find, during the treatment of acute inflammation, that the slightest evidence of gangrene is presented, warm applications should be substituted, and the temperature of the part elevated.

The vitality of any portion of the body may be destroyed by the constant application of very cold water; it is therefore necessary, when irrigation is employed, that the water should not be too cold. That taken from a spring or hydrant is preferable to that at a lower

temperature. Should the part present a bluish appearance, then it should be protected by an additional towel or fold of soft porous cloth to diminish the evaporation. In the third stage of mortification there is an entire separation of the dead from the living tissues, except the osseous. Never think of amputating until the separation has occurred, and then the operation is exceedingly simple. The soft parts should be detached from the bone about an inch above the part exposed, and retained in that position by a retractor, until the bone can be divided with an amputating saw. Many years ago I treated a young man, who after being exposed to intense cold, had his feet and legs plunged into hot, if not boiling, water, in consequence of which, both legs mortified below the knees, and the thighs were scalded so badly, that the skin was entirely destroyed, and an extensive suppurating surface resulted. I have never treated so disagreeable a case. The bones were not divided until they became perfectly denuded, and the patient recovered with the loss of both legs, although many months were required to heal the ulcers resulting from the application. Amputation is sometimes performed before the line of demarcation is distinctly defined, and then the disease generally extends upwards, so as to require a second operation, which is almost always fatal.

Gangrena senilis, as before stated, results from defective local action produced either by a partial or an entire obliteration of the arteries which supply the extremity with blood. The limb diminishes in size gradually, becomes black and shrivelled, and these symptoms are accompanied with pain of the most excruciating character.

Fig. 4.



As there are but few old persons in California, I have met with only one case during a residence of fourteen years. The subject was a native of this State, and was eighty-five years of age. The disease commenced in the toes of the left foot, extended slowly, and when it

had reached two or three inches above the ankle, the pain, combined with the debility resulting from age, produced a fatal result. Gangrena senilis generally occurs in the lower extremities, but sometimes, as in Fig. 4, it is located elsewhere, and presents precisely the appearances represented by that cut. In such cases, the treatment can only be palliative. The strength should be supported by the use of nutritious food, and the pain relieved either by the administration of opium or some of its preparations.

The best local application is cotton batting. The extremity should be thickly covered, and the air excluded by the application of a bandage. The disagreeable smell can be removed, either by a solution of the chlorate or permanganate of potassa, the chloride of lime, or any other disinfectant. I generally use the chlorate of potassa, ℥ss. to a quart of water, which should be applied as often as the part is dressed, or even more frequently if necessary.

Having concluded what I intended to say upon the terminations of inflammation, delitescence, resolution, and mortification, I will now consider the results of inflammation.

1st. *Effusion, or a Deposition of Serum.*—This is very common, and occurs more frequently in the cellular and serous tissues, as the eyelids, and in cavities lined by a serous membrane, than elsewhere. It may also result in inflammation of the mucous membrane, as in œdema of the glottis, which may be produced by exposure to cold without being sufficiently protected. You will often find an infiltration or deposition of serum in the cellular tissue of the lower extremity; then it is called anasarca.

If pressure be made with the finger upon any portion of the distended limb, a pit or depression will remain, which indicates the character of the effusion. If serum be deposited in the pleural cavity, it is called hydrothorax; in the abdomen, ascites; in the pericardium, hydrops pericardii; in the cranium, hydrocephalus; and in the scrotum, hydrocele. Every serous cavity, when inflamed, is liable to an accumulation of serum, which presents a limpid, yellowish, greenish, or dark appearance, which depends on the location and the intensity of the diseased action. It may also be combined with both blood and purulent matter. It is saline to the taste, free from odor, coagulates readily by the addition of either alcohol, acids, or corrosive sublimate, and is composed principally of albumen, combined with earthy sulphates.

Serum is sometimes deposited very rapidly, of which fact those of you who have been so unfortunate as to have been stung by a bee, wasp, or hornet, are fully apprised. Also after a severe injury, the part soon becomes enormously swollen, which may result from two causes, the effusion of blood, and that of serum.

The effusion of serum frequently results from the debility produced by an impoverished condition of the blood. It may depend upon interrupted venous circulation, produced either by enlargement of the spleen, liver, or other important internal organs. It also very frequently results from inflammation of the serous membranes which line the great and important cavities of the body. Professor Gross thinks that serum may be deposited without the existence of inflammation, but as a general rule, serum, whether it occupies the cellular tissue or any of the serous cavities, is one of the results of inflammation.

Treatment.—Your remedies will depend entirely upon the cause. When ascites is produced by an abnormal condition of the venous circulation, resulting from induration and enlargement of the liver, or other important abdominal or thoracic organs, you must endeavor to remove the cause by prescribing the treatment calculated to remove or overcome the organic lesion. In such cases counter-irritants are always useful, but their extent and character must be left to the judgment of the physician.

Should the effusion result from disease of the liver, an effort should be made to restore secretion and remove the effusion, by the combination of calomel, squills, and digitalis, according to the following recipe:

℞.—Submur. Hyd.,
Pul. Rad. Scillæ, āā . . . . . gr. xvj.
Pul. Fol. Digit., ... gr. viij.
M. Fiant pil. No. viii. Sig. Take one pill four times a day

These pills may sometimes be given for three or four days, without ptyalism being produced, and when tolerated, they form one of the most powerful diuretics that can be administered in such cases. You should, however, recollect that dropsical patients are usually very susceptible to the action of mercury, and so soon as its specific effect is produced, either diuretics or hydragogues should be substituted, and continued until the serum is removed. There is a combination

of diuretics which I can recommend, and should that fail it would be useless to give any other articles of that class.

℞.—Pot. Nitratis, ... ℥iij.
Tinct Fol. Digit., ... ℥j.
Syr. Scillæ, ... ℥iij.

M. Sig. Take one teaspoonful every three hours, until the desired effect is produced

If the action of the kidneys cannot be increased, the comp. ext. of elaterium should be given in half-grain doses every two hours, until it produces copious serous evacuations from the bowels; and when that remedy fails, which frequently occurs, then the operation of paracentesis abdominis should be performed. In the mixture recommended, you will find three of the most powerful diuretics, and they rarely fail to remove serous effusions, except when they result from organic disease of the kidneys, and when these organs have ceased to act, and cannot be forced to perform their function.

Its effect was not only striking, but extraordinary, in a case which occurred about three years ago in this city. M. Dumas was supposed by his physician to be in the last stage of Bright's disease. The urinary secretion was scanty, and composed of equal quantities of urine and albumen, all the serous cavities were filled with serum, he was blind, and had a convulsion about every three hours; he had been in that condition two days before I was called. Believing that he might still be saved if the urinary secretion could be restored, the diuretic mixture was given every two hours, ice was applied to the head, and the circulation in the extremities increased by the use of bottles filled with warm water. In twenty-four hours the convulsions ceased, the urinary secretion was greatly augmented, and in less than a week he could distinguish surrounding objects, the entire serous effusion had disappeared, and he is now in good health.

Two other cases of albuminuria, which were considered Bright's disease, accompanied with many of the symptoms already given, have been recently relieved by the use of that combination. These cases should serve as a caution to you all, and prevent you from placing yourselves in the same position. However hopeless a case may appear, do not despair of success, for even in this disease extraordinary recoveries take place. You should therefore always give the remedies indicated, and they may succeed even in apparently desperate cases.

In dropsy resulting from cardiac disease, the diuretic mixture should be given three or four times in twenty-four hours, and if continued or administered at short intervals, a patient by its use may be kept comfortable for months and even years. Should the effusion result from disease of the liver, in consequence of a neglected intermittent fever, after it has been removed by the use of diuretics, then give one pill four times a day, prepared according to the following formula:

℞.—Quiniæ Sulph., ... ʒj.
Pul. Rad. Rhei,
" Sang. Canadensis,
Ext. Cicutæ, āā . . . . . ʒss.
M. Fiant pil. No. xxx.

These pills prevent the recurrence of the fever, which is very important, and are laxative. Long experience enables me to say that they are unquestionably the most safe and reliable deobstruent in such cases that can be administered. With that combination alone, I have cured many cases of dropsy, produced by enlargement of the spleen and liver, and in malarious districts it is invaluable, as it is the only remedy that will prevent a recurrence of the paroxysms of intermittent fever. When dropsy results from anæmia, produced either by hæmorrhage or any other cause, then the precipitated carbonate of iron is exceedingly valuable, and may be given either with laxatives or alone, as may be indicated.

In ascites, when internal remedies fail to afford relief, the operation of paracentesis abdominis should be performed. The trocar may be passed through the abdominal parietes in the linea alba, at a point equidistant from the pubis and umbilicus, and no large bloodvessels will be endangered. The operation may also be performed in the centre of a line drawn from the umbilicus to the superior anterior spinous process of the ilium with equal safety. Before plunging a trocar into the abdominal cavity, be sure that it contains serum. When the abdomen is distended by that fluid, if you place one hand on the side and lower part of the abdomen, and strike the opposite side with the other hand, a distinct fluctuation will be detected. After some experience, it is almost impossible to be mistaken, yet a mistake may occur when excessive œdema exists, and when a doubt is entertained it should be removed by the use of an

ordinary exploring needle, which may be inserted at either of the points indicated; if the distension results from an accumulation of serum, a few drops will follow the needle when removed; if the distension results from any other cause, no serious inconvenience will result from the operation. Whenever a doubt exists always use the exploring needle. It may not be necessary after twenty or thirty years' experience, without which no man can diagnose disease with unerring accuracy. I therefore repeat, should any doubt exist respecting the existence of dropsy of the internal cavities, always use the exploring needle, and by that it will be removed.

The next result to which I will direct your attention is fibrinous exudation, or to use the language of Prof. Gross, lymphization, a term which I think is more expressive, and consequently should be preferred. It is found wherever inflammation exists, and particularly when the serous membrane is involved. In pleurisy, adhesions take place readily between the pleuræ pulmonalis and costalis in consequence of the tendency to lymphization.

Inflamed mucous membranes also furnish lymph, but neither so readily nor abundantly as the serous membranes; but when they do, the consequences are much more serious. The substance which closes the larynx in membranous croup is nothing more than lymph, or a fibrinous exudation from the mucous membrane. The only treatment that can be successful is to dissolve the false membrane by the administration of the subcarb. of potash, which may be given to children under four years old in doses of from one to three grains every hour or two, according to the urgency of the symptoms. We are indebted to a German physician for the discovery of this remedy, and with it I have saved children after every other remedy had failed.

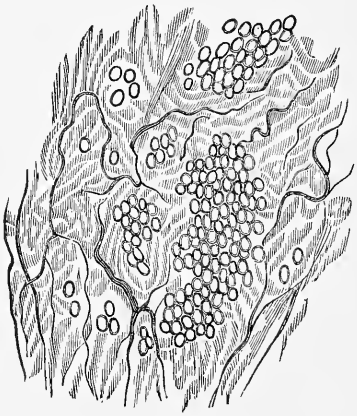
Except in fractures, the fibrous and osseous tissues furnish but little lymph. In six or seven days, however, after such an accident lymph is thrown out around the extremities of the fractured bone, the interstices are filled, and then ossific matter begins to be deposited, and is continued until a complete union of the bone is accomplished.

It is astonishing how soon the deposition of lymph commences, and how rapidly it increases. Prof. Gross thinks that it sometimes commences in an hour. In a case in which he operated for intussusception, although the patient died in four hours, he found an

abundant secretion of lymph which had been formed during that interval. A difference of opinion exists respecting its origin. Some think that it is a product of the bloodvessels, and is most probably a secretion. Virchow, however, believes that it is an extra-vascular process. It is of little consequence where, or how it is formed, if its appearance, properties, and use are understood.

In color it is generally whitish or of a pale straw color, but sometimes it presents a reddish appearance. It is composed of numerous spherical globules about $\frac{1}{2500}$th of an inch in diameter, and is identical with the liquor sanguinis, or blood liquor, and the buffy coat. It possesses vital properties, and when deposited in a fluid state, it may assume almost any form. The period at which organization commences is very doubtful; I am satisfied that it begins very soon, and sometimes in a few hours. For that reason, we should always, before closing a wound, when union by the first intention is desired,

Fig. 5.

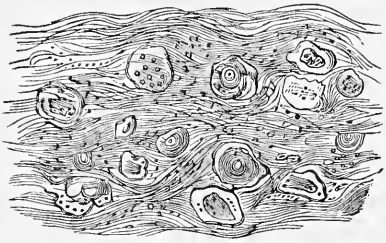


wait until the surface becomes glazed or covered with lymph, and then, when the edges are approximated, they unite, and the connecting medium becomes speedily organized.

Fig. 5 represents lymph-globules recently formed, which have been magnified three hundred and eighty diameters. They bear a strong resemblance to pus-globules, and were deposited upon the surface of the pleura.

Fig. 6 represents a false membrane with corpuscles resembling primary cells.

Fig. 6.



In Fig. 7, you will find nuclei and cells developing into fibres.

Fig. 8 represents the fibrous membrane after the change has been completed.

Fig. 7.

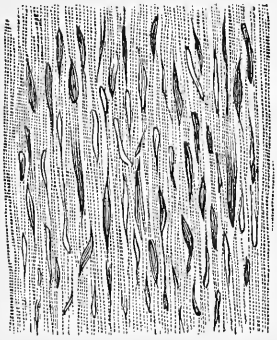


Fig. 8.

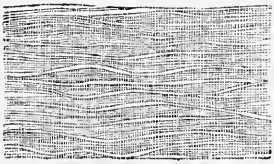
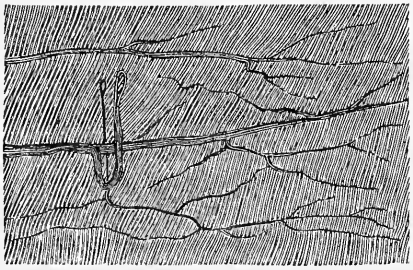


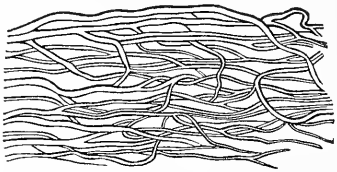
Fig. 9.



Figs. 9 and 10 exhibit the appearance of newly formed vessels in plastic lymph.

These illustrations, I think, will be sufficient to convince you that recently effused lymph may assume almost any shape. It becomes organized very readily, except in the bladder and alimentary canal,

Fig. 10.



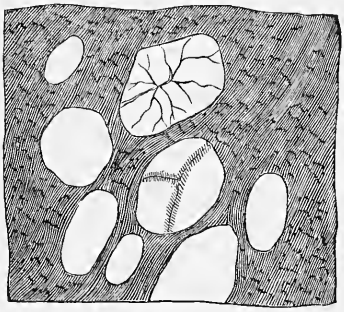
Vessels in false membranes of pleura.

and there such a change never does occur, which is exceedingly fortunate, for reasons that will be given when the diseases of the mucous membranes are under consideration.

LECTURE VI.

GENTLEMEN: In this lecture the subject of lymphization will be continued. After lymph has become completely organized, it may be absorbed, an example of which you witnessed at the hospital.

FIG. 11.



Fibrous exudation in process of absorption.

Another very extraordinary case occurred recently in my private practice. The patient was a resident of Sacramento when he contracted syphilis. The chancre was located upon the glans penis, and for convenience, the prepuce was drawn back so as to expose the ulcer, and was retained in that position until a permanent paraphimosis resulted. The glans penis was strangulated sufficiently to produce an enormous enlargement, and the chancre had resisted the treatment usually adopted in such cases for six or eight months, when, by the advice of his physician, he visited San Francisco to have the organ amputated. Instead of removing the glans penis, as he desired, an ordinary roller was applied every day, until the prepuce became detached by ulceration; it passed over the glans as soon as it was reduced to its natural dimensions, and when the congestion which resulted from the constriction disappeared, the ulcer healed.

Lymph may also be converted into pus. Whenever a part becomes so much inflamed as almost entirely to arrest the circulation, the lymph previously deposited is converted into pus. It is the

material from which pus is produced, and an abscess is formed by the absorption of the surrounding parts for its accommodation. It also furnishes the basis of analogous tissue. It is called analogous, because the lymph deposited in the tissue of the part, when organized, resembles the original structure.

It is also the basis of heterologous tissue, which is entirely different from that which composes the organ or tissue in which it is located. Heterologous tissue may be either tuberculous or cancerous, both of which differ in every respect from all the natural and healthy tissues of the body.

What is the use of lymph? There are two varieties, which are called plastic and non-plastic. By the former all injuries are repaired, and without it a wound would neither heal, nor a divided artery be obliterated. In six, eight, or ten hours, according to the age and the constitutional energy of the patient, a sufficient quantity of plastic lymph is effused upon the edges of the wound, for adhesion to take place, provided they be approximated and retained in contact. The bloodvessels pass at first into and finally through the lymph effused, and ultimately the connecting medium becomes perfectly organized. Some difference of opinion exists respecting the time required, which will be hereafter considered.

It is by the agency of plastic lymph that the radical cure of hernia is effected, which is a very common occurrence in children from the application of an ordinary truss. The protruding part being returned, and retained by a truss, sufficient inflammation is produced by the pressure it exerts, to secure such a deposition of lymph as to unite the opposed surfaces of the inguinal canal, and when perfectly organized, the union is sufficiently firm to prevent a recurrence of the difficulty. It sometimes isolates foreign bodies. In a gunshot wound, when a ball has not sufficient velocity to pass through the part it enters, and it occupies an inaccessible position, a sufficient quantity of plastic lymph is often deposited to form a cyst, by which it is isolated and rendered no longer offensive to the surrounding parts.

In internal abscesses, either of the lungs or liver, the sac is formed in the same manner, and when the pus approaches the surface of the organs, adhesions of the serous membranes take place by its agency, and the effusion of pus, either into the pleural or peritoneal cavities, is prevented.

It also obliterates serous cavities, which is illustrated in hydrocele. If the scrotum be punctured with a trocar, the fluid removed, and the comp. tincture of iodine diluted with an equal quantity of water be injected, and allowed to remain five minutes, the cavity which contained the serum will either be obliterated, or cease to secrete that fluid, which formerly produced the distension.

Although it is invaluable in the cases enumerated, and without its agency it would be impossible for the surgeon to accomplish anything by which a reputation could be obtained, yet serious consequences may result from its presence under certain circumstances. The natural outlets of the body may be obstructed, as in membranous croup and diphtheria. In the former the lymph is generally deposited in the larynx, becomes organized, and as soon as the opening is sufficiently contracted to prevent the oxygenation of the blood, the patient will die of asphyxia. In diphtheria, besides the mucous membranes of the nares and larynx, that of the trachea becomes speedily and so extensively implicated, that it is really incurable. Should tracheotomy be performed to admit the air, the cavity will be found so contracted that in a majority of cases no benefit will result. I have performed the operation of tracheotomy four times in diphtheria, and have resolved in such cases never to repeat it. Abnormal adhesions also exist, as in the thorax, but they usually produce little inconvenience. When the articulating surfaces are allowed to remain too long in the same position, or become inflamed, plastic lymph may be effused, and when organized the joint is permanently anchylosed. Such a result is exceedingly common after fractures of the thigh, particularly if they be compound and do not unite readily, by which the patient is required to remain in the same position for several months. Anchylosis should never occur in such cases, and when it does, it results either from the ignorance or negligence of the surgeon. It is exceedingly important in the treatment of fractures of the extremities to flex and extend them at least every week. If the patient be forty years of age, and has been accustomed to hard labor, if that precaution be neglected, the joints become stiff in three or four weeks, and in two months they will, unless great force is employed, be immovable. Induration and enlargement both result from inflammation, and are produced by the deposition and organization of plastic lymph. They should be treated by antiphlogistics and sorbefacients of a more or less active character, according to the

peculiarities of the case. As a local application the tincture of iodine is generally better than any other remedy of that class, although great benefit frequently results from the use of mercurial ointment, and in some cases it will be found superior to any other remedy. In enlargement and induration of the testicle, it should be preferred, as the tincture of iodine cannot be applied to the scrotum without producing pain sufficient to counteract the ordinary effect of the remedy.

Enlargements of the spleen and tonsils result from the same cause. The spleen becomes enlarged in malarious districts of country, and may remain in that condition during a long life, provided the patient be exposed to the cause by which it was originally produced. Remove him from that locality, and give him one pill four times a day, composed of qui. sulph., rheum, sang. canad., and cicuta, in the proportions previously recommended, and the enlargement and induration will soon entirely disappear. When the tonsils become enlarged they should be removed, and suitable remedies prescribed to counteract the tendency that exists in such cases to disease, both of the mucous membrane and lymphatic ganglia.

Suppuration.—The next result which presents is suppuration. By this we understand the formation of a peculiar fluid called pus. It is opaque, about the consistence of cream, presents a pale yellow or straw color, and when microscopically examined, globules appear floating in a transparent fluid. Pus always sinks in water, which should be remembered, as it may enable you to make a more correct diagnosis in some cases of pulmonary disease. It should not be forgotten, however, that when it is combined with mucus it presents the appearance of that fluid, and floats as readily when placed in water.

It coagulates or becomes consistent by the application both of heat and muriate of ammonia.

The formation of pus generally indicates the existence of a higher degree of inflammatory action than is required either for the effusion of serum or lymph, although some think that pus may be found without the existence of inflammation.

It is true that when the general health is greatly impaired, the formation of pus is accompanied with but few of the evidences of inflammation, yet it is difficult to believe, even in cases of cold abscess, that imperfect pus can be formed without increased local vascular

action, which always varies in different cases and constitutions. Pus is unquestionably a secretion. It is prepared by the capillary vessels, and it may take place either with or without a solution of continuity. The serous membranes, as the pleura and peritoneum, furnish it most abundantly, yet when the mucous membranes are inflamed pus is frequently secreted. It varies in color as well as in consistence and other properties, either from an admixture with blood, bloody serum, or mucus, or from the peculiarity of the part affected, and the condition of the patient. The formation of pus may be either superficial or interstitial. It is said to be superficial when formed by the mucous membrane of the urethra, by the conjunctiva, or the mucous membrane lining the bronchial tubes. It is interstitial when the secretion takes place under the skin, or in the texture of an organ; and it is then called an abscess, which is said to be circumscribed when its extent is limited by the effusion of lymph, phlegmonous when it results from excessive vascular action, and cold when but little, if any, perceptible increase of heat is observed. In erysipelas, there is usually an absence of pus. When it assumes a phlegmonous character, pus frequently forms in the subcutaneous cellular tissue, and even under the pericranium, producing an extensive exfoliation of bone.

As soon as pus is secreted, or in other words, as soon as suppuration takes place, both the pain and tension diminish, and fluctuation becomes distinct.

When suppuration takes place internally, besides the diminution of pain, rigors occur at irregular intervals, and they do not yield to the treatment necessary in intermittent fever. The contents of an abscess may be removed, or in other words, pus may be absorbed without producing any constitutional disturbance. Modern pathologists believe that pus-globules are not absorbed entire. They become disintegrated, the fluid portion is absorbed, and the remainder produces no local inconvenience.

In some cases, a small abscess, even of a syphilitic character, may disappear without increasing the danger of secondary disease.

Whenever an abscess acquires considerable magnitude, absorption rarely occurs. The contents usually find their way either to the surface of the body, the bronchial tubes, intestinal canal, or to some other natural outlet, and very rarely break into an open cavity. An abscess should always be opened as soon as fluctuation is distinct;

by pursuing this course, pain is relieved, there is less destruction of the surrounding cellular tissue, the cicatrix is smaller, and the danger of extensive ulceration occurring in the attenuated parietes, which results from delay, is entirely removed.

When I am not permitted to open an abscess at the proper time, particularly if it be located upon an exposed portion of the body, I advise the application of poultices until the integument is removed by the absorbents, because when opened too late, if the patient be disfigured by the cicatrix, the physician, whether he has erred or not, is always censured.

An abscess may be opened with a lancet, a small bistoury, or by the application of caustic potash. I generally use a thumb lancet, because it is more convenient, is less dreaded, and makes an opening sufficiently free to allow the contents to escape readily. An ordinary tenotomy knife is an admirable instrument for opening small abscesses upon the neck and face, and with it you can make either a large or small incision as may be necessary. Caustic potash may be employed, when an extraordinary dread of cutting instruments exists. After the covering has become attenuated, one grain should be applied upon the most prominent part, and retained by the use of a strip of adhesive plaster. In two or three hours the vitality of the part will be destroyed, and an opening can be made either with a lancet or bistoury without giving the slightest pain. Should the patient prefer, apply the warm-water dressing or a poultice until the slough separates and allows the pus to escape. After opening an abscess, a small portion of wet lint should be inserted. The quantity should not be sufficient to produce painful distension, but only enough to prevent union by the first intention, and then either the warm-water dressing or a poultice may be applied, according to the location of the part or prejudice of the patient. The dressing should be changed as often as necessary to preserve cleanliness. Should the abscess be large, and the discharge abundant, it should be dressed two or three times in twenty-four hours, and even more frequently in very warm weather, particularly if it be offensive. An abscess is said to be cold when it is neither preceded by pain, nor the other evidences of the existence of acute inflammation.

The diseases liable to be mistaken for an abscess are encephaloid, aneurism, and hernia. The inexperienced may find some difficulty in distinguishing a tumor of an encephaloid character from an abscess,

the elasticity of the tumor being mistaken for fluctuation, when the size, location, and the time required for the development of this variety of malignant tumor be taken into consideration. I think such mistakes should not occur very frequently. In two cases in this city, in one of which the tumor was located on the posterior and lateral portion of the pelvis, and the other on the superior and left side of the thorax, encephaloid has been mistaken for abscess and opened. Each weighed about seven pounds, and had acquired that magnitude in a few weeks. They were not painful until they became so by their size, and yet the error of diagnosis was made by physicians of more than twenty years' experience. I mention these cases to render you more cautious, and before you express an opinion, if a doubt is entertained, always use the exploring needle. It gives but little pain, and is never followed either by hæmorrhage or any other serious inconvenience, without regard to where it has been introduced.

You should always be able to distinguish an abscess from an aneurism, by the strong pulsation that exists in the latter, as well as by the absence both of pain and discoloration of the skin; and still mistakes of that character are made. About four months ago I was requested to see a gentleman of this city, who had experienced considerable inconvenience from a tumor in the left axilla. It was covered by a flaxseed poultice, and I was told that his physician, who was one of the most experienced practitioners in the city, considered it an abscess, and intended to open it in the morning, and consequently they were anxious to have my opinion before the operation was performed. I found a firm, pulsating tumor, without either elasticity or fluctuation. I directed his friends to send for the physician, and tell him that I thought it was an aneurism, and probably he might pursue a different course of treatment.

When tumors appear upon the upper part of the thigh, in the groin, or on the inferior portion of the abdomen, the history of the case should, if possible, be obtained when any obscurity exists. An inguinal abscess usually commences as a small, hard, and painful tumor in the groin, while inguinal hernia makes its appearance above Poupart's ligament, about three inches from the anterior superior spinous process of the ilium, and is not accompanied with pain. In ordinary cases the enlargement disappears when the recumbent position is assumed, but when any portion of the abdominal contents

escapes, in consequence of a violent muscular effort, very soon the symptoms of strangulated hernia will appear. Such a difficulty should not be mistaken for an abscess, neither should incarcerated hernia, which must have existed longer than is required for the formation of an abscess. Whenever you find it difficult to decide, always bring the exploring needle to your relief.

Prognosis.—The prognosis will depend upon the character and location of the swelling, as well as upon the constitution of the patient. A simple abscess, produced by a contusion, or which results from acute inflammation, is neither important nor dangerous. Should an abscess be located in the lumbar region, or present in the groin, below Poupart's ligament, without being preceded by the symptoms which usually accompany inflammation, then you should suspect the existence of caries of some portion of the vertebral column, which sooner or later must prove fatal. In such cases, your prognosis should conform with the condition of the patient. As soon as an abscess of that character is opened, whether by an incision or by the absorption produced by pressure, hectic fever follows, and in a few months the patient is exhausted by the purulent discharge, excessive perspiration, and colliquative diarrhœa which always exist in a difficulty of that character.

Treatment.—Always endeavor to treat inflammation in such a manner as to cause it to terminate by resolution. Should you find, however, that such a result cannot be obtained, then apply either the warm-water dressing or a poultice constantly, until fluctuation becomes distinct, when an opening should be made and the case treated as before directed.

There is another difficulty of this character, which is much more serious than an ordinary abscess, and is called diffuse or multiple abscess, pyæmia, or purulent infiltration, terms which are applied to the same disease. This kind of abscess may result from any wound or injury, and should be particularly dreaded in phlegmonous erysipelas. When phlebitis results either from operations upon or injuries of the veins, which will hereafter be considered, the symptoms usually attributed to, and supposed to result from purulent infiltration, are always present; consequently I believe that phlebitis is the most fruitful source of this dreadful disease.

Sometimes, in a few days after a simple operation, the patient after complaining of being chilly, will experience pain either in the wrist

or in some other joint. The chill will be followed both by a hot and a sweating stage, which, by the inexperienced, might be mistaken for an attack of intermittent fever, if it were not accompanied by the pain in one or more of the articulations, and if the paroxysms did not return more frequently than in ordinary cases of a malarious character. Sometimes, in a few days after these symptoms appear, the breathing becomes difficult in consequence of the infiltration of purulent matter in the substance of the lungs, and the patient will die after suffering for a few days with all the symptoms of typhoid pneumonia.

In puerperal cases, frequently at the fourth or fifth day, and sometimes without there being previously any decided symptoms of peritonitis, the patient will complain of pain in one or more of the joints accompanied with fever, and the other phenomena which characterize this disease. These symptoms should always be regarded as of a very serious character, because they result either from phlebitis or purulent absorption from the suppurating surface, produced by the detachment of the placenta.

Usually in such cases the symptoms become more and more aggravated, although the patient may live from one to three weeks, according to the parts implicated and the extent of the deposit. When either the liver, lungs, or other internal vital organs are implicated, the disease, which is almost always fatal, will terminate much more speedily than if it had been confined exclusively to the joints. I said that this disease is almost always fatal, which is unfortunately too true; the following constitutes a rare exception.

Mrs. C., aged about 50 years, being annoyed by a fibrous tumor on the neck, it was removed, and I endeavored to heal the wound by the first intention. On the fourth night after the operation she had a chill, which was followed by fever and a pain in the left wrist-joint. The wound was opened and lint wet with tinct. opii, aqua ammoniæ, with double the quantity of aqua destil., was inserted, and the water-dressing applied. A depressant mixture was administered to control the fever, and in three or four days, the unfavorable symptoms had all disappeared. I am satisfied that her recovery resulted from the change of treatment, and since then I have not attempted to heal such a wound by the first intention. You should always leave the most dependent part of the wound open, for the purpose of allowing the secretions, both serous and purulent, to

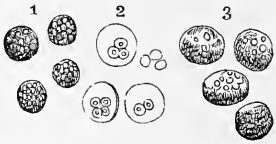
escape readily, in order to prevent the occurrence of pyæmia, which is the most dangerous complication that could arise during the treatment of a severe injury, whether it results from an operation or is produced by accident.

A scrofulous abscess differs from the ordinary variety, both in its

Fig. 12.

Puriform fluid from a softened lymphatic gland.

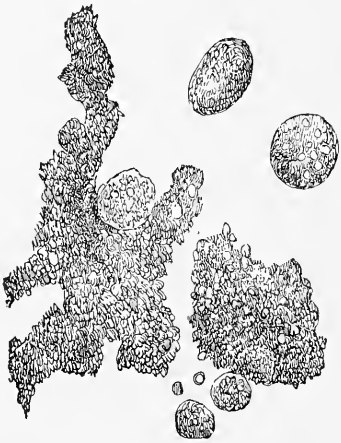
Fig. 13.



Pus-globules.

progress and the appearance of the pus secreted, as may be seen by referring to Fig. 12. Under this head hectic fever should be consid-

Fig. 14.



Pus from a scrofulous abscess.

ered, but before taking up that subject I beg leave to direct your attention to the appearance under the microscope of healthy pus-globules, as well as the varieties which we should expect to find in scrofula and the other morbid conditions of the system.

LECTURE VII.

GENTLEMEN: This morning I propose to say a few words respecting hæmorrhage as a result of inflammation, which is so rare that I have only met with one case in either this or my native State. The case referred to occurred only a few weeks since, and followed an operation for varicocele performed in a young man of sanguine temperament, and of an exceedingly full habit. Until the second day after the operation the parts were neither unusually inflamed, nor very painful, but then the scrotum became red and enormously distended by an extravasation that had occurred between the tunica vaginalis and testicle. When an incision was made at least half a pint of blood escaped. The vein was not wounded, and nothing unusual occurred until the third day, when the parts became inflamed. So soon as the distension was removed, the inflammation subsided rapidly under the application of cold water. In four or five days both the pain and swelling had disappeared, and the result of the operation was as satisfactory as if the hæmorrhage had not occurred.

Absorption.—We understand by absorption the removal of tissues more rapidly than they are furnished by the nutrient vessels. In other words, whenever absorption is more active than nutrition, ulceration must result, and may be either superficial or interstitial.

When it commences in the skin it is said to be superficial. A small portion of the cuticle may be detached by violence, or a vesicle may appear, which if neglected or irritated may extend, and in a short time become an ulcer of considerable magnitude. Pressure is the most common cause of absorption, whether it be superficial or interstitial, consequently when pressure is made by the distended vessels of a part inflamed, the ulceration continues to extend until the inordinate vascular action is controlled.

Nutrition ceases so soon as inflammation occurs, and absorption becomes more active in consequence of the pressure produced by the distended vessels. Ulceration may also result from the effusion or secretion of pus, or from the presence of other substances which do

not naturally belong to the part affected. When pus is secreted under the skin, whether it be superficial or deepseated, the pressure it exerts increases the action of the absorbents, by which the parts that intervene between the fluid and the integument are more or less rapidly removed, and when the skin yields to the pressure, and the contents escape, an ulcer is produced.

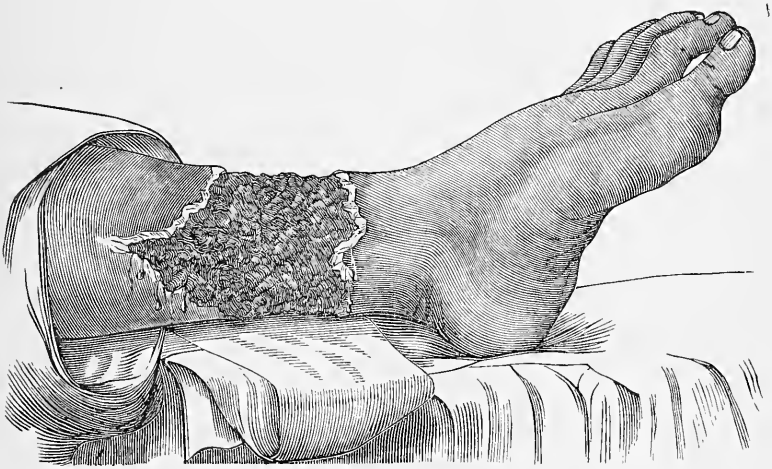
Fluids and even pus may be removed without the occurrence of ulceration, when the pressure is not great, and the cause not very active, by the application externally of counter-irritants and sorbefacients. The best sorbefacient is the tincture of iodine, but if the part be irritable, it may be combined with an equal quantity of the tincture of arnica. The best vesicant I know of is that sold under the name of "Birt's blistering fluid;" it vesicates in a few hours; it is very certain in its effect, and it rarely causes strangury, which is one of the most distressing consequences attending the application of an ordinary blistering plaster.

When pus is secreted interstitially, ulceration of the skin does not necessarily result. What is an ulcer? The most concise definition which I can give is that it is a solution of continuity which secretes pus. When a wound does not heal within twenty-four hours, union by the first intention becomes impossible, and then you have what is called an ulcer. For several hours after a wound is received there is a discharge of serum mixed with more or less blood, according to the location of the injury; when that ceases, lymph is deposited, and by the third day it is usually sufficiently organized for red points to make their appearance, which are called granulations. They are when healthy both red and rounded, and they are small in proportion to the health and constitutional vigor of the patient. They bleed when touched, and sometimes are exceedingly sensitive. I do not think that I can describe granulations so that you will understand their appearance, variety, and peculiarities so well as by the study of a specimen. Fig. 15 represents an inflamed and spreading ulcer. Absorption is more active than nutrition, and the time that elapses from its origin until it is arrested is called the period of extension. After it has ceased to extend, and before it begins to heal, the period of arrest and the process by which an ulcer is healed, is called cicatrization.

So long as an ulcer is violently inflamed it always enlarges. Control the inflammation by suitable remedies, and plastic lymph is

effused around the edges, and forms a ring which encircles the ulcer and arrests its progress. The surface is also covered with lymph, which becomes vascular, and granulations soon make their appearance. A single granule is transparent, but two or more present a

Fig. 15.



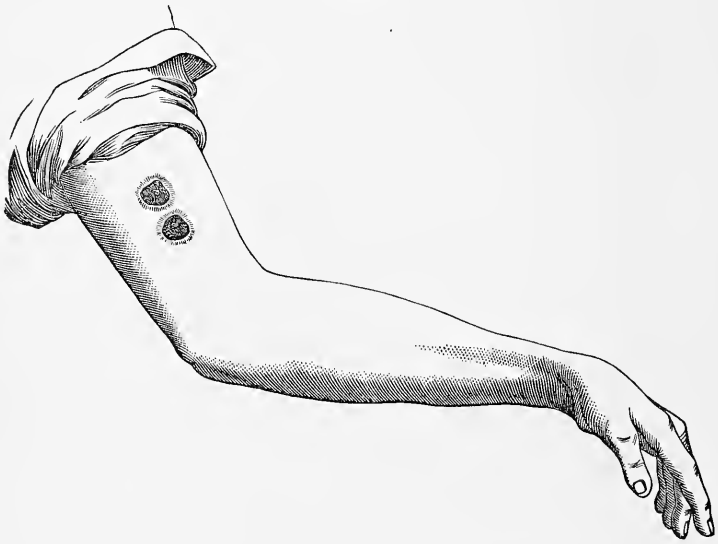
Inflamed irritable ulcer.

red appearance, which becomes more intense with increased vascularity. It is an interesting question how the blood finds its way into these granulations. The vessels form in loops, and from them branches spring out and extend until the circulation is established, and it is astonishing with what rapidity the necessary supply of blood is furnished. In my clinical lectures I have said repeatedly that an ulcer will not heal so long as the surface is below the edges. In indolent callous ulcers which do not heal from defect of action, there is no remedy by which their character can be changed except pressure. Apply a roller bandage properly, and the elevated and indurated edges of the ulcer will be absorbed, and the ulcerated surface being supported will soon begin to granulate, and when the granulations rise as high as the surrounding skin, cicatrization commences usually at the edges, but sometimes also in the centre. The outer layer of the lymph is converted into a sort of epithelial scales, which cover over and protect the subjacent parts. The processes of cicatrization may be hastened by the application of nitrate of silver, applied gently

every day or every alternate day to the granulating edges, which are sufficiently elevated to render cicatrization possible. Care should be taken that the granulations are not entirely destroyed by the application of the escharotic. It should be applied so gently as only to cause them to adhere, so as to favor the development of epithelial scales, which completes the process.

Fig. 15, before exhibited, represents an inflamed ulcer; the edges as you will perceive are covered with a grayish matter which cannot be removed. When it appears, and so long as it continues, you may feel assured that the ulcer is extending, and will continue to extend until its character is changed. The inflammation involves the entire foot; no healthy granulations can be discovered, and the color presented is produced by the disintegration of the surrounding tissues. The part is not mortified, but the disintegration is so rapid that it resembles it very closely. Before you commence the treatment of an inflamed ulcer, you should endeavor to ascertain whether any consti-

Fig. 16.



Acute or healthy ulcer.

tutional derangement exists sufficient to account for the local difficulty, and prescribe the treatment calculated to meet the indication. The patient should be placed in a horizontal position, and the foot

elevated so as to diminish the influx of blood. The water-dressing, poultices, or soft cloths wet with a strained decoction of poppy-heads should be applied, and covered with oiled silk so as to prevent evaporation, and the whole secured by the application of a bandage. Never apply a solution of the acetate of lead to an ulcerated surface. In such cases, besides the constitutional treatment indicated, the patient must be kept free from pain by McMunn's elixir, or some other preparation of opium, or the anodyne may be combined with the remedies calculated to remove the constitutional difficulty. Such ulcers occur very frequently in the old and intemperate, are generally located on the lower extremities, and are always exceedingly difficult to control.

Fig. 16 represents a healthy ulcer. The granulations are red, round, and not very large; they are even with the skin, and the ulcer is in a condition to cicatrize rapidly.

Fig. 17 is intended to present the appearance of an old, indolent,

Fig. 17.

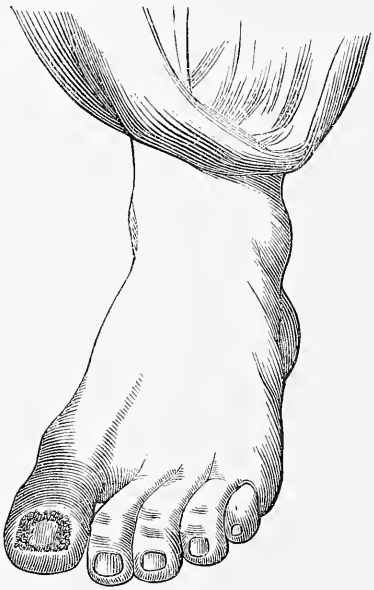
Callous ulcer.

and callous ulcer; the granulations are large, flabby, and pale. The edges are elevated, everted, and indurated, but sometimes in such cases they are inverted.

Fig. 18 is intended to present the appearance of an inflamed ulcer

produced by an inverted nail. This is an exceedingly painful and troublesome difficulty, and can only be relieved by elevating the edge with forceps, and introducing lint wet with a saturated solution of alum. By such treatment the inflammation is controlled, and a

Fig. 18.



Toe-nail ulcer.

recurrence of the difficulty prevented, provided the treatment is continued until the ulcer cicatrizes, and the nail has extended beyond the extremity of the toe; should that fail, remove the inverted nail with the matrix, and the disease cannot recur.

An ulcer will cicatrize, but the cicatrix differs from the natural integument. It is a fibro-cellular substance, is less vascular, less sensitive, and differs in color from the original integument, which is never reproduced.

Ulcers should be dressed twice a day, and great care should be taken not to break or disturb the granulations. Be careful to keep the dressings so wet that they will not adhere to and disturb the process of cicatrization. When the inflammation has been controlled, simple cerate and a bandage is the best dressing that can be made. I have no faith in the efficacy of medicated ointments;

they should only be applied to indolent ulcers. Generally simple cerate or mutton suet, neither of which will irritate the granulating surface, should be preferred. When a stimulating application is needed, the basilicon or citrine ointment, diluted with an equal quantity of lard, should be employed, with proper constitutional treatment, and by the use of the bandage all other means may be dispensed with. Any old indolent callous ulcer can be healed by the common roller bandage, with no other local application except mutton tallow or simple cerate. Two healthy granulating surfaces when approximated and retained in contact will unite as certainly as an incised wound. A case has recently occurred in my practice by which this was demonstrated. A gentleman from Stockton, who was in feeble heath, had an epithelioma removed from the lower lip. The day after the operation he had a paroxysm of intermittent fever, which prevented union by the first intention; the sutures were allowed to remain. Sulph. quiniæ was administered to prevent a recurrence of the fever. He drank a bottle of porter every day, and was directed to take as much nutritious food as he could digest, and in one week the union was as complete as if it had occurred by the first intention.

Sometimes when wounds with a considerable loss of substance heal, the cicatrix is so contracted as not only to produce deformity, but also to interfere seriously with the function of the part. The treatment necessary in cases of that character will be hereafter indicated. This is so important a subject that a concise recapitulation will not be unacceptable to the class. I have endeavored to render you familiar with the appearances presented by the ulcers which are not disposed to heal.

1st. The callous ulcer will not heal in consequence of defect of action.

2d. The irritable or inflamed from excessive action.

3d. In syphilitic and other ulcers from peculiarity of action.

1. The surface of an ulcer may be either depressed or elevated.

2. They may be inverted or everted and indurated.

3. The discharge may be purulent, thin and ichorous, bloody or mixed.

4. The adjacent and surrounding parts may either present a natural appearance, or they may be both red, swollen, and indurated.

5. Pain depends on the character of the ulcer. It is very dis-

tressing in the irritable and inflamed, and is rarely complained of in the indolent.

When there is a defect of action, what course of treatment is indicated? If the patient be old, debilitated, and intemperate, give tonics, alteratives, and stimulants. The prescription given in a previous lecture, composed of quinine, rhubarb, sanguinaria Canadensis, and cicuta, may be given with porter, wine, or any other stimulant in moderate quantity after meals, especially if the patient has been accustomed to excessive stimulation.

In the constitutional treatment the improvement of the general health should receive your especial attention; this should never be neglected, for if it be not improved, the best-directed local treatment will fail. Always dress an ulcer so that the secretion can escape as fast as it is formed; consequently you should never apply dry lint either to a wound or ulcer, because it will adhere to the surface and prevent the escape of the purulent secretion, which will, when a considerable accumulation takes place, make sufficient pressure to produce an absorption of the granulations for its accommodation.

If lint be applied it should be wet, and the moisture retained by the application of oiled silk. Always apply a dressing that will neither irritate nor adhere to the surface of an ulcer. You may use simple cerate, mutton tallow, glycerin, or chalk ointment, it is immaterial which, if it fulfils the indication. After an ulcerated surface has been cleansed and any of the articles enumerated applied, then wet a common roller bandage either with water or diluted alcohol, and apply it firmly but smoothly from instep to knee. When dressed in that manner every day I cannot imagine an ulcer that will not heal. Pressure is more important in the treatment of such cases than all the other local remedies combined. Baynton recommended adhesive strips applied in such a manner as to support the granulations. Cures have unquestionably resulted from their employment, but no one who can apply a bandage would ever think of substituting adhesive strips. They are more troublesome, and are liable to the objection made against the use of dry lint as a dressing in such cases. The secretion is confined, and if abundant, as it cannot escape, the ulcer instead of healing will become daily more extensive.

Ulcers with excessive action require very different treatment, as pressure cannot be advantageously applied. The patient should be

placed in a recumbent position, and every means adopted calculated to quiet both the constitutional and local disturbances. Depressants combined with opium, if the pain be distressing, will accomplish the former. Never allow a patient to suffer pain or pass a sleepless night, for you cannot diminish the vascularity of an ulcer so long as the pain continues. In the latter I have already advised the ordinary remedies; sometimes they all fail. The ulcerated surface becomes more and more painful, a diphtheritic deposit takes place, accompanied with a profuse acrid and offensive discharge. I have met with five or six cases of this character, and recently two occurred in one family as a sequence of scarlatina. In one the ulcer was produced by the application of a small blister, which was employed to denude a surface for the purpose of applying the sulphate of morphia to relieve a pain in the left side of the chest. Instead of healing as usual, it became excessively painful, and soon presented the appearance described. It resisted the action of the usual remedies, and I became convinced that if relief was not speedily afforded, the general health must suffer from the pain and the quantity of opium which it was found necessary to administer; I therefore determined to apply the nitrate of silver, the patient being under the influence of chloroform. It was applied in a solid form effectually two days in succession; flaxseed poultices were applied until the slough was detached. The surface of the ulcer was then covered every day with the subnitrate of bismuth, and protected by the water-dressing until it cicatrized.

In the other case the ulcer resulted from a small portion of the cuticle being detached from the second joint of the middle finger. It spread so rapidly and its progress was accompanied by so much pain that I became exceedingly solicitous for the safety of the finger. The same local treatment with suitable constitutional remedies were prescribed and with a similar result.

When irritable ulcers continue to enlarge in spite of the treatment adopted, they are called phagedenic, and when the skin and subcutaneous cellular tissues lose their vitality, sloughing ulcers. When chancres are neglected or improperly treated, the parts frequently slough with fearful rapidity, the entire organ being sometimes destroyed in forty-eight hours.

When an ulcer heals at one point and appears at another it is called serpiginous; we very often meet with syphilitic ulcers which

present that peculiarity. The only remedy which I have found effective to change the action and arrest their progress is nitric acid. It should be repeated every three or four days until the desired effect is produced.

When an ulcer resists all treatment it is called a cancer, and then all that can be expected from medical treatment is to relieve the pain, and by the use of opium to render the condition of the patient supportable. Ulcers which do not heal from a peculiarity of action may result from derangement of the digestive organs, suppression of the catamenia, a scrofulous diathesis, or constitutional syphilis. In all the varieties of ulcer, the local treatment should depend upon the stage and condition, and the constitutional remedies should be adapted to the constitution of the patient, and the cause by which the local difficulty has been produced, which will hereafter be considered.

There are other peculiarities of ulcers with which you should be familiar. The surface of an ulcer may be either depressed or elevated. When an ulcerated part is kept in a horizontal position long enough for granulations to appear, whether they be healthy or otherwise, the surface of the ulcer very soon becomes elevated above the surrounding integument. But should it be placed in a dependent position without support, the granulations are destroyed, and the surface is depressed. In indolent ulcers, particularly upon the lower extremities, the edges are always indurated, and may be either inverted or everted. This peculiarity, however, will disappear in a few days by the use of the bandage, and of internal remedies calculated to remove the constitutional derangement.

Pain.—We have already said that the pain depends on the irritability of the patient and the degree of local inflammation. Sometimes the surrounding and adjacent parts become thickened and indurated, with but little redness, but in irritable ulcers, the redness corresponds with the violence of the local action, and the pain it produces.

The discharge from ulcers differs as greatly as they do in appearance. You should expect the secretion from a healthy ulcer to be what is called laudable pus, which has been already described. From an ulcer with defect of action, a thin offensive fluid escapes, resembling a mixture of serum with unhealthy purulent matter. From an irritable or inflamed ulcer, bloody serum, which does not present the slightest resemblance to the discharge that should be secreted by

a healthy granulating surface. Always examine the discharge from an ulcer before you express an opinion respecting its character and curability. When an ulcer has existed for several years, is it good surgery to heal it, even if it be possible? Unless the patient be scrofulous, if the ulcer be located upon the extremities, I think it is always safe, provided the bowels be kept free by the use of laxatives. Three years ago I cured an ulcer on the leg larger than my hand, that had been discharging for more than twenty years. The leg was enormously enlarged, and the discharge was profuse. By the use of the bandage and laxatives, the limb was reduced to its normal size, and the ulcer healed, with a decided improvement of the general health.

In a previous lecture I endeavored to describe the textural changes that result from inflammation, and will allude to them in this lecture.

Ramollissement or Softening, both Acute and Chronic.—The latter occurs more frequently in the brain, the mucous membrane of the stomach and bowels; the former in the lungs, spleen, liver, and heart. I have, however, occupied as much of your attention on this subject as the time allowed me will permit, and will speak of induration, which results from the effusion and organization of lymph.

The organs most liable to induration are the lungs, spleen, liver, thyroid gland, testicles, ovaries, lymphatic ganglions, and bones. We have now in the hospital a case of induration and enlargement of the thyroid gland. There are other organs which may also become indurated, as the subcutaneous cellular tissue and prostate gland, particularly in advanced age. This is very liable to enlargement and induration, which gives great inconvenience, because it renders the passage of urine not only difficult but sometimes impossible.

Enlargement of the spleen and liver, when produced by repeated attacks of intermittent fever, yields almost always to the combined influence of quinine, rhubarb, sanguinaria Canadensis, and cicuta. The quinine and sanguinaria Canadensis prevent the recurrence of the fever, and in combination with the other ingredients, will remove the enlargement by increasing the biliary secretion, and improving the general health. I have, both in California and elsewhere, wit-

nessed the most extraordinary effects from this combination. I have known the sanguinaria alone to remove an enormous enlargement of the spleen, and prevent the recurrence of intermittent fever by which it was produced, in a few weeks, after it had resisted the treatment of the best physician in the vicinity. Being struck by its effect in that case, I combined it with quinine, rhubarb, and cicuta, and from long experience have been convinced of its great efficacy, and that that combination is superior to any other, not only to prevent the recurrence of intermittent fever, but also to remove the indurations of the spleen and liver which it produces.

The next subject which presents itself is transformation, of which there are four varieties:

1st. The cellular, as in the thymus gland and capsular ligament.

2d. The fibrous, as found in the arteries and veins.

3d. Calcareous, in the arteries and joints.

4th. The fatty, in the arteries, heart, liver, etc.

The thymus gland in infancy is quite large; it is located near the upper extremity of the sternum, and after birth it diminishes gradually in size until it almost entirely disappears, which is called transformation.

Fibrous transformation occurs in the coats of an artery after it has been ligated, between the point occupied by the ligature and the first large branch above; all the coats undergo that change. The same change takes place in the veins when the circulation is obstructed by the use of pins or otherwise, as in the operation for varicocele.

The third variety is the calcareous. This occurs very frequently in the arteries of old people, but it is sometimes met with in persons who have not reached middle age. Three years ago I treated a consumptive patient, 28 years old, in the St. Mary's Hospital, and found that every superficial artery had undergone that change, which is easily detected by the diminution in the volume as well as by the induration and irregularity of the vessel. I have from observation been induced to believe that intemperance favors or predisposes to this transformation. The first case of this character which I had an opportunity of examining carefully, I found in my dissecting-room about twenty years ago. The young man had died in the lunatic asylum. He had been paralyzed for several years, and it was found to be impossible to dissect his body in consequence of every bloodvessel

having undergone calcification. A quiescent or inactive state may also favor the deposition of calcareous matter.

Fatty degeneration occurs more frequently than the calcareous, and its consequences are also more serious. The heart, liver, and bloodvessels suffer more frequently from this difficulty than the other important organs of the body.

This liability of the bloodvessels to fatty degeneration will account for the extraordinary number of deaths which occur from aneurism, both in California and on the entire Pacific coast.

Fatty transformation of the heart and liver are both very common, if we can rely upon the certificates of death found in the health office of this city. The unexceptionable prosperity of our liquor merchants will suggest the cause. When that difficulty occurs the affected organ presents too pale an appearance, and is diminished both in size and consistence, which when the heart is implicated becomes very serious, because it soon is incapable to perform its function. When fatty transformation takes place in the liver, the organ diminishes in size, becomes pale, the granulated appearance is changed into a grayish mass, and very soon the eyes and skin present a yellowish or leaden appearance, cerebral symptoms are presented, and the scene is speedily closed.

This is a disease of a very serious character, and the question now arises, can it be prevented, and by what means can it be arrested after it has occurred? Professional experience has been barren of useful results, but the advice I should give in order to avoid its development is to take sufficient exercise, live temperately, and you have little to fear from fatty transformation or degeneration. Hypertrophy or an increase of magnitude is not uncommon, and occurs more frequently in the heart and thyroid gland than elsewhere. It may be either partial or general. It results from the deposition and organization of plastic lymph, and the tissue thus produced resembles that of which the organ was originally composed; it is consequently called analogous. It increases in magnitude without presenting other evidences of disease. The causes are inordinate exertion, vascular obstruction, and chronic inflammation. The porters in Paris, who carry enormous loads, are very subject to hypertrophy of the heart; cases are met with in all the hospitals of that city, and it is not necessarily connected either with valvular derangement or dis-

ease of the arteries. When the venous circulation is disturbed, as in a varicose condition of the veins of the lower extremities, the parietes of the vessels become thickened, distended, and greatly elongated, and even when obstructed by an operation never present a normal appearance.

After the subsidence of chronic inflammation, the part affected may never resume its original size and appearance, although it may be perfectly healthy. Atrophy or shrinking may result either from want of exercise, from loss of nervous influence, or from inflammation. Should the arm of a healthy man be carried in a sling for three or four months, the muscles will be so much atrophied as to lose almost entirely their contractile power. Loss of nervous influence is followed by the same result. I am familiar with a case of this character. A gentleman had his right shoulder severely injured, which was followed by inflammation of the joint and the adjacent parts. When the inflammation disappeared it was found that the power of the forefinger and thumb was almost entirely lost, and the sensibility of the other three fingers was destroyed, without the power of the muscles being in the slightest degree impaired. The difficulty no doubt resulted from the pressure which was made by the effusion and organization of lymph during the existence of the inflammation, and yielded slowly to the application of counter-irritants to the shoulder, combined with moderate but constant exercise.

Atrophy may also result from inflammation, and it is especially liable to follow that produced in the testis by the metastasis which frequently occurs in mumps. When that gland has become atrophied under such circumstances, it is useless to annoy the patient by prescribing remedies from which he can derive no benefit.

A few remarks upon contraction and obliteration will finish this lecture. The former frequently results from the cicatrization of wounds, from which considerable loss of tissue has been sustained, especially in cases of extensive burns. The contraction frequently increases for some time after the wound has cicatrized. Thus the under lip may be drawn down so much, that it is impossible to conceal the teeth. When the contraction is so great and extensive, it is impossible to afford relief even by the most skilful plastic operation. When less extensive, the deformity may be entirely removed by a procedure that will be described in a subsequent lecture.

The canals or outlets of the body, which are lined by a mucous membrane, may become contracted, and produce the disease called stricture, which will hereafter receive especial attention.

Fistula may be included in this lecture, from its connection with diseases of the mucous membrane. A fistula is a narrow, straight or tortuous canal, with one or more openings, which secretes a fluid, and may be located upon any portion of the body, but appears generally in the groin, on the neck, or near the anus; it frequently originates from carious bone, a diseased lymphatic ganglion, or from pulmonary disease, which it is intended to palliate.

LECTURE VIII.

THE subject of the present lecture is congenital malformations, which are exceedingly important and should be well understood.

They consist first of a deficiency of parts, which includes fissures as well as entire absence.

Fissures are most common; they embrace harelip, fissure of the palate, epispadias, hypospadias, spina bifida, and enlargement of the fontanelles. In epispadias there is not only a deficiency, but also a malposition of parts. The urethra not only terminates before reaching the extremity of the corpora cavernosa, but also is found upon the upper side of the penis, and directly below the symphysis pubis, and beyond that point the urethra does not extend. In hypospadias, which is much more common, the urethra may open in front of the scrotum, or at any point posteriorly to its base. Sometimes there is a complete division of the scrotum between the testicles.

Epispadias I believe to be incurable. It occurs so rarely that I have never had an opportunity of performing an operation in such a case, and indeed I think it could not be successfully done.

Hypospadias.—This deformity may under favorable circumstances be cured. I operated two years since upon twins under very unfavorable circumstances, and from the result obtained I have arrived at that conclusion.

The patient should be placed upon the back, with the hands and feet secured as in an operation for stone. A flexible catheter should be introduced, and retained in the bladder for at least a week, after the operation has been performed.

The cuticle is first removed from the opposite sides of the fissure, sufficiently far from the centre, so that when the denuded surfaces are placed in contact, the catheter can be covered without so much traction being made as to endanger the vitality of the skin, and diminish the prospect of union by the first intention.

When approximated the denuded surfaces should be kept in contact by the interrupted silver suture, which should be allowed to

remain at least ten days, so that if union by the first intention should fail, it may occur by granulation. In such cases it is almost impossible to succeed in removing the entire difficulty by one operation, particularly in children. In some cases after union has taken place, in consequence of a constitutional peculiarity, the presence of the sutures may produce inflammation sufficient either partially or entirely to destroy the bond of union, and subject you to the necessity of repeating the operation.

Enlargement of the fontanelles is a very common difficulty, and for that reason it is mentioned so that you may know what advice to give in such cases. Such children always present a delicate appearance. The head is unnaturally large, and the fontanelles as well as the sutures unusually open. Such cases do not require local treatment, but in consequence of the arrest of osseous development, the remedies calculated to improve the general health should be prescribed. Three or four half-grain doses of calomel at night may be given to produce a healthy action of the liver, which should be followed by the precipitated carbonate or phosphate of iron, or Quevenne's iron, combined with the fluid ext. of senna if a laxative be necessary, and either the tincture of nux vomica, quinine, or the subcarb. of bismuth, according to the indications of the case under treatment.

Absence of Structures.—Sometimes there is an entire deficiency of important parts. About a year ago I delivered a patient of a child that had neither hands nor feet. The superior extremities were deficient from the middle of the forearm, and the lower from the centre of the thighs. The inferior maxillary bone and the tongue were both unnaturally small, although the infant was able to take sufficient nourishment from the breast not only to live, but also to enjoy good health for eight months, when he died of cholera infantum.

Recently I delivered a monster both in size and shape. The knee and elbow-joints were anchylosed, and the arms and legs turned directly inward. The same defect existed in the tongue and inferior maxillary bone which has already been described. The child weighed sixteen pounds, remained in the uterus eleven months, and was delivered with greater difficulty than I ever before experienced, except when deformity of the pelvis existed. The child was born alive, but the respiration being difficult in consequence of the contraction of the respiratory muscles, it fortunately lived only a few days. Any

portion of the body may be absent, and it is unnecessary to enumerate all the cases of this character that have been reported. Supernumerary parts are met with frequently. Sometimes a child is born with an extra finger, and it is almost always attached to the external side of the little finger, near its junction with the hand. I have seen the thumb double, with two bones and distinct and separate nails. The supernumerary part must always be removed, but you should invariably wait until the period of dentition has passed, and the general health is good. This course should be observed when the fingers adhere, or a distinct articulation exists. When the attachment is small and composed only of the integument, it may be removed early without the least apprehension of any serious consequence resulting. Never perform either this or any other operation that can be postponed when erysipelas is prevalent.

Harelip.—In order that you may understand what the word harelip means, I have had drawings made which will represent every variety of this common and exceedingly unpleasant deformity.

Fig. 19 represents the simplest form of the disease, a mere fissure

Fig. 19.

Fig. 20.

which extends only to the nostril, and there is no defect either of the superior maxillary bone or soft palate.

In Fig. 20 you see what is called a double harelip, there being a fissure in each side, and this variety may be either simple or complicated with a fissure of both the hard and soft palates.

In some cases there is not only a defect of the palate, but a fissure exists on each side, generally uniting at about the centre of the hard palate. In such cases what remains of the upper lip projects from the superior extremity of the nose. The difficulty experienced in their treatment is to close the fissure in such a manner that a notch will not remain, which is always an unmistakable evidence that an operation of that character has been performed.

The operation in simple harelip consists in paring off the edges either with a scalpel or scissors, and approximating and retaining them in contact, either by the harelip pins and the figure-of-eight suture, or by the interrupted silver suture, which I think is superior to the former.

I have always found it necessary, in order to retain the edges of the lip in perfect apposition, to insert a small silk suture, which may be removed the third day; but the needles or silver sutures should be allowed to remain six or seven days, because they give no inconvenience, and by pursuing that course a failure is impossible. When the alæ of the nose are greatly separated, and drawn downwards, they should be detached and placed in their proper position. The best operation for harelip, and the only one that can be performed by which the deformity is entirely removed, is as follows:

The mucous membrane on one side is preserved, and removed from the other, so that when the edges are approximated, it can be drawn across so as to prevent a fissure at the point of union. It should be secured by a suture composed of a single thread of fine silk.

When two fissures exist, the edges of the centre piece should be removed so that they may unite with the corresponding portions of the lip on each side. A curved needle should be inserted about half an inch from the edge of the lip on one side, passed down to the mucous membrane, through the centre portion and the lip on the opposite side, in the manner already described. Three sutures are all that are necessary even in the most aggravated case. Should the centre portion be short, the deficiency can be supplied by drawing a portion of the mucous membrane across, and attaching it to the opposite side. I performed this operation successfully a few days since in a case that appeared very unpromising.

If a child be able to nurse, I would not advise an operation to be performed before the fifth or sixth month. If the deformity be so great as to interfere with nutrition, then the operation should be

performed within the first week. Always be careful not to allow the patient to lose much blood. It would be better to apply a small ligature to every bleeding vessel than to incur the risk of hæmorrhage, either primary or secondary.

The third variety mentioned is exceedingly complicated: the upper lip is deficient; the teeth are exposed, and there is a projection from the end of the nose, and a deficiency exists both in the hard and soft palate. The deformity in these cases, unpromising as they appear, can be entirely removed. In the first place dissect up from the bone the superior portion of the lip on each side, with the alæ of the nose; remove with forceps the plate of bone that sustains the teeth directly backward on a line with the septum of the nose; reduce the size of the projection from its extremity, so as to form a septum, turn it down and secure it in that position by passing the first suture through it, which is intended to bring the edges of the lip together. After the removal of the teeth, and the formation of the septum, they can be approximated and retained in contact as easily, and as little deformity will result, as from an operation for the simplest variety of harelip. When the fissure extends through both the hard and soft palate, that in the former may be closed by constant and moderate pressure made upon both sides of the superior maxillary bone.

Fig. 21.

Dupuytren's instrument consists of two small pads connected with a bandage half an inch in width that passed over the upper lip, and was secured by a buckle behind, and retained in the proper position by a strap which passed over the head.

The shape of the bones of young persons can be easily changed. The best illustration I can give is afforded by the Flathead Indians of Oregon. Soon after birth a thin smooth piece of wood four or five inches in width is applied to, and secured upon, both the anterior and posterior portions of the head, and the application is continued until the fontanelles close, and the cranium by a bilateral development has assumed the shape desired. This is accomplished without giving the child much inconvenience. The position of the bones of the face can be changed with equal certainty by constant and moderate pressure.

A fissure of the soft palate is an exceedingly unpleasant difficulty, as it always impairs the voice, and sometimes interferes seriously with deglutition.

It was considered incurable until Roux practically demonstrated that it was as amenable to surgical treatment as any other deformity. The operation required in such cases is called staphylorraphy, and consists, as in harelip, in paring off the edges of the fissure, and in lacing and retaining them in contact by the interrupted silver suture until union takes place.

The patient should be placed before a window, and whilst the tongue is pressed down by an assistant, one edge of the fissure should be seized with long delicate forceps, and removed either with a sharp scalpel or bistoury. I have frequently removed the mucous membrane from both sides of the fissure without changing the position of the forceps. The sutures may be placed either before or after the edges have been removed, and a small curved needle secured by Roux's porte-aiguille, the one invented by Sims, and found in his case, or that which I will hereafter exhibit, which I directed Mr. Volkers, of this city, to make for this operation as well as that for vesico-vaginal fistula. The points of suture should be about half an inch apart, and when the uvula is involved, a single thread of silk should be preferred to retain the edges in contact, as its presence will be less inconvenient to the patient. Should any difficulty be experienced in approximating the edges in consequence of a deficiency of the parts, two lateral incisions should be made so as to lessen the tension, and remove the possibility of a failure by strangulation.

So long as it is necessary to allow the sutures to remain, solid food should be prohibited. Operations of this character usually require both patience and considerable manual dexterity. Sometimes you

will find a case in which no difficulty will be experienced. The first operation I performed was completed in sixteen minutes, and I have sometimes found it impossible to complete it in less than an hour. Even Roux, who was one of the best operators in Paris, was sometimes an hour in performing this operation. In a case of extreme difficulty upon which he operated before the class, the mouth was small, the maxillary bones very long, and there existed apparently a morbid sensibility which caused an effort to vomit to result from even touching the palate with instruments. I succeeded in two cases in this city in which the mucous membrane and palate-bones were both destroyed, leaving an opening an inch long and half an inch in width without involving the soft palate. After the edges were removed and the sutures inserted, lateral incisions were made, and the mucous membrane that intervened between them and the fissure was detached from the bone, which enabled me to approximate the edges without the slightest difficulty, and union by the first intention occurred. The lateral incisions should be longer than the opening in the hard palate, about three-fourths of an inch from it, and the mucous membrane should be detached the entire length of the incision, so as to allow the edges to be approximated without difficulty.

Wry neck is another deformity which, although not very common, occurs occasionally, and results from a permanent contraction or shortening of the sterno-cleido-mastoideus muscle. All that is necessary in such cases is to divide the muscle subcutaneously from within outward. Take hold of the muscle above the centre with the forefinger and thumb of the left hand, pass the tenotomy knife with the back turned toward the vessels, and cut outwards, being careful not to wound the skin. You cannot be too cautious when performing operations upon the neck, particularly near the sternum. After the muscle has been divided, the head should be placed in its proper position and retained until ligamentous union takes place between the extremities.

Club-foot is the next deviation of position to which your attention will be directed. It results from a permanent contraction of one or more of the muscles of the part implicated. There are four distinct varieties. In talipes varus the bottom or sole of the foot is turned inward and the weight of the body rests upon the outer ankle.

Fig. 22 represents this variety, which is the most common, and is produced by a shortening of the tendo Achillis, fascia plantaris, and sometimes other muscles. I have never in the treatment of such

Fig. 22.

cases found it necessary to divide anything except the tendon and fascia already mentioned. I am now treating three cases of this character with an improved club-foot shoe with a very flattering prospect of success.

Fig. 23.

Fig. 23 represents a foot turned in the opposite direction, which is called talipes valgus. The weight of the body rests upon the inner

ankle. This difficulty is not uncommon, although it does not occur so frequently as the other variety.

Fig. 24.

Fig. 24 will give you a correct idea of the variety called talipes calcaneus. The toes are elevated and the heel only is used in locomotion. I saw a case recently in which the upper sides of both feet were in contact with the legs, in consequence of the excessive contraction of the muscles.

Fig. 25 is a correct representation of talipes equinus. The lower extremities of the metatarsal bones are exceedingly prominent. The heel is drawn upward so much that the extremities of the metatarsal bones are the only part of the sole of the foot which is used in locomotion. I operated upon a gentleman of this city thirty-eight years old, and in ten days he walked as well as if that difficulty had never existed.

The question now arises,—are these deformities curable, and if so by what means can it be effected?

When a child is born with either varus or valgus, a straight splint well padded with cotton should be applied upon the external side of the leg, extending from the knee to the extremities of the toes, and secured by a bandage for the purpose of bringing the foot on a line

with the leg. When this has been accomplished and the child is five or six months old, in varus the tendo Achillis and plantar

Fig. 25.

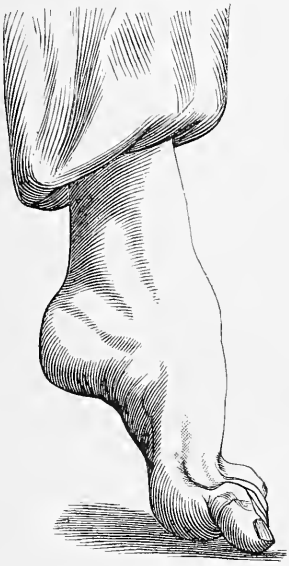
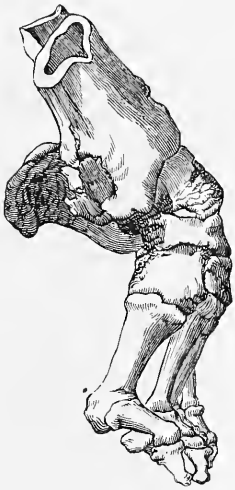
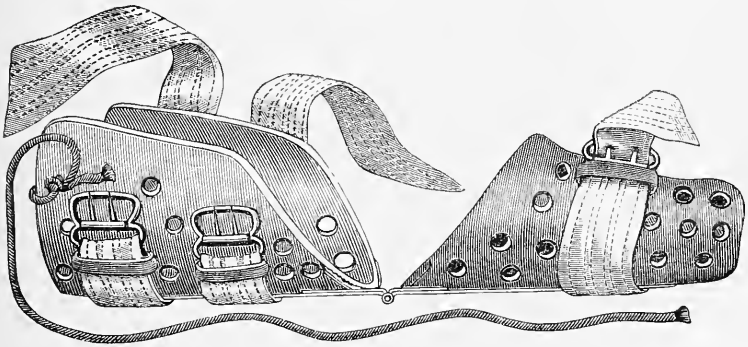


Fig. 26.



aponeurosis should be divided subcutaneously. The foot and leg should then be covered with cotton batting, and the shoe represented

Fig. 27.



by Fig. 27 applied. It is made of perforated felt, is moulded on a last the shape of a healthy foot, and by its use, before the

child is old enough to walk, the foot will present as natural an appearance as it would if that difficulty had not existed. Then the leg portion can be applied to an ordinary shoe, or Tieman's modifica-

Fig. 28.

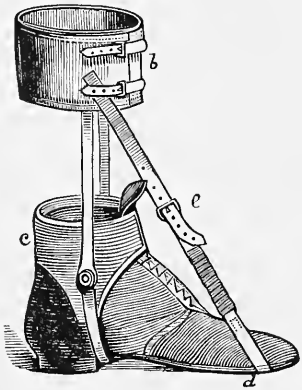
tion of Scarpa's shoe substituted. In talipes valgus the tendons of the peroneus longus and brevis should be divided, and the same shoe applied, after the use of the straight splint as already directed.

In talipes equinus the tendo Achillis only should be divided, and when that has been accomplished, the foot can be restored to its proper and natural position by the use of the same shoe in a very short time.

In talipes calcaneus the tendons of the tibialis anticus and flexor communis digitorum pedis should be divided, which will enable you to apply the felt shoe recommended for the other varieties, with the addition of a strap which passes under the bottom of the shoe, and is attached to the posterior and upper portion of the leg-piece, for the purpose of drawing the foot downward into its proper position. This shoe is all that will be required in the treatment of children, but in older subjects the apparatus represented by Fig. 31 is preferable. It is made of wood, is perfectly simple, can be easily adjusted, and fulfils the indications better than anything that has been employed in cases of talipes equinus or calcaneus.

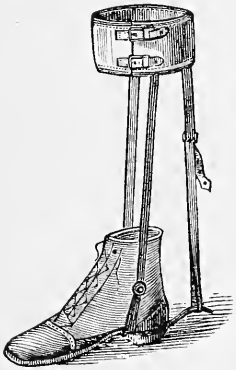
The tenotomy knife should be inserted about half an inch from the tendon, and passed under the skin until the side of the blade is directly over it, when it is relaxed by extending the foot so as to remove the danger of wounding the integument. The cutting edge

Fig. 29.



should then be placed in contact with the part to be divided. The foot being forcibly flexed, and some pressure made upon the blade, it will pass readily through the tendon, and the tension will disap-

Fig. 30.



Tieman's shoe.

Fig. 31.

Shoe for talipes equinus and simplex.

pear. I have always operated in this manner, and have never wounded either the anterior or posterior tibial arteries. The operation being completed, the wound should be closed by the application of isinglass plaster and a bandage, which should be allowed to remain for ten days, and then the club-foot shoe substituted. When the

deformity has been removed, and the child is old enough to walk, have the leg-piece attached to an ordinary laced boot without a heel, and the child will walk as well as if no difficulty had existed.

Having always been disappointed by the ordinary club-foot shoe, in the treatment of young children, although opposed to the increase of surgical instruments, I had a simple apparatus made of felt, which is cheap, easily adjusted, immovable, and consequently decidedly superior to any other instrument that has been used in the treatment of this deformity.

In every variety of club-foot, it is exceedingly important to protect the integument by the application of fine cotton batting. The foot should be examined two or three times a week, in order to ascertain whether the pressure be equably applied, so as to prevent ulceration. Besides the straps and buckles which are intended to retain the shoe in its proper position, I frequently apply a bandage, and this is especially necessary in talipes calcaneus. When the skin is excessively irritable, the shoe should be removed at night, so as to enable the patient to obtain the requisite amount of sleep.

In flat or splay-foot, as you have already been told, the external side of the foot is to a greater or less extent turned upward, and the internal and middle portion, directly under the malleolus internus, is more prominent than any other portion. This is not always congenital. When the foot is not sufficiently arched, the ligaments yield to the weight of the body so much, that the foot is not only flat, but the centre becomes the most prominent. This difficulty occurs most frequently in delicate children, and in those more advanced, of a strumous diathesis, who are compelled by their occupation to remain long on their feet. If it receive attention early, this deformity can be prevented by the application of shoes with long broad heels and stiff counters, in combination with tonics, animal food, and exercise suitable to the condition of the patient.

Adults with flat feet, who are compelled to stand for eight or ten hours in the twenty-four, suffer great pain in the afternoon, which is generally mistaken for rheumatism. It is anterior to the internal malleolus, and is located in the ligaments. To give relief, the occupation should, if possible, be changed, and the heel of the boot or shoe be made at least an inch longer than the one ordinarily worn, which removes the weight of the body from the heel, and diminishes the tension of the ligaments by which the tarsal and metatarsal bones are connected.

This cut represents the appearance of the lower extremity, which results from an enlargement of the condyles of the femur. They project over the head of the tibia, which rests upon the posterior portion of the articulating surfaces, and the joint presents this extra-

Fig. 32.

Disease of knee.

ordinary appearance. In females it frequently exists without being detected, even by their most intimate friends, as no perceptible lameness exists in ordinary cases. It is always of a strumous character, and especial attention should be paid to the general health.

The feet are liable to a peculiar disease called podelcoma or ground itch. I have known it often to result from the feet being allowed to remain in mud and water for several hours in succession, which frequently is the case with boys in the Southern States who are fond of fishing, and indulge in that amusement barefooted. It appears on the soles of the feet as well as between the toes. It is accompanied with excessive itching, and sometimes with great pain and ulceration. The best remedy is citrine ointment, combined with an equal quantity of lard, which may be applied morning and evening until the disease is controlled, and then simple cerate should be substituted.

Pododynia, or pain in the soles of the feet, is very common, and results from remaining too long upon them. Tailors, clerks, and others, compelled to stand ten or twelve hours a day, are very liable to this troublesome difficulty. I have suffered from it occasionally from the same cause, and the best remedy which I have employed is to shower the feet with water as hot as it can be borne, at night, and by morning the pain will have disappeared, but is always liable to occur from a repetition of the cause. It is more inconvenient than serious, and is only mentioned because we are frequently consulted in such cases, and are expected to prescribe remedies that will afford relief.

LECTURE IX.

GENTLEMEN: We have not yet finished congenital malformations. Those omitted are occlusion of the rectum, and nævus. The lower extremity of the rectum may be closed simply by the mucous membrane. In such cases the bowels are constipated; the child becomes restless; vomits frequently; the abdomen is distended, and jaundice frequently makes its appearance in three or four days after birth, provided the obstruction is not removed. When such symptoms appear, always examine the anus, and if you find it closed, but prominent and elastic, the protruding part should be divided either with a lancet or bistoury. The contents of the bowels will then escape, and no more inconvenience will be experienced.

The rectum may be deficient for an inch or more, and all the symptoms enumerated will exist, except the prominence resulting from the distended rectum. A case of this character occurred a few years ago, in which a transverse incision was made an inch in depth before the extremity of the rectum could be discovered. It was then opened freely with a bistoury, and kept from closing by the use of the largest gum-elastic male bougie, which was introduced every alternate day, and allowed to remain fifteen or twenty minutes. In the third variety the rectum opens either into the bladder or vagina; either case is very serious, and difficult to treat successfully. I attended a case in this city in which the rectum terminated in the vagina about half an inch from the vulva. An opening was made through the perineum into the extremity of the rectum, and when established, that which existed in the vagina was closed by the interrupted silver suture by a single operation. When the rectum terminates in the bladder the case is beyond the control of the surgeon.

Nævus is a congenital difficulty of considerable importance, but not so dangerous as surgeons formerly supposed. It is a disease of the bloodvessels, and generally those of the skin only are implicated. It may result either from an enlargement of veins or capillaries, but when the arterial circulation is increased, it is called aneurism by

anastomosis. You will often meet persons with some portion of the face disfigured by this enlargement of the bloodvessels. When the veins only are implicated the part does not present a bright-red appearance, and no pulsation can be detected. When the arteries are both enlarged and increased in number, the color is not only more bright, but there also exists a distinct pulsation which corresponds with that of the heart. When a nævus of this character is removed and examined, it will be found to be composed entirely of bloodvessels united by cellular tissue. It is called nævus or mother's mark, because it is generally believed that it results from some mental impression experienced by the mother during gestation. Some years since I published in the *Pacific Medical Journal* some singular cases of this character, which could not be otherwise explained. When the vessels become greatly enlarged, ulceration frequently takes place, and then the hæmorrhage is often profuse. When they are located where pressure cannot be made, it becomes necessary to ligate the vessels which furnish the blood. A few days since I saw a child six weeks old with an immense nævus above the left eye, that was bleeding profusely. The hæmorrhage was arrested by the application of Monsel's salt, and the parents advised to have the temporal artery ligated so soon as the child recovered from the loss of blood which it had sustained. When a nævus is located where compression can be made, then it should be removed either with the knife or scissors, no matter how large it may be.

I have never experienced the least difficulty in arresting the hæmorrhage after such an operation. A fold of wet lint larger than the nævus should be covered with Monsel's salt, and held by an assistant so that it can be applied in an instant after the nævus is removed, which if it be small can be done more conveniently with scissors than with either a scalpel or bistoury. The nævus should be raised with a tenaculum, and excised with curved scissors; Monsel's salt should then be firmly applied, and retained four or five minutes, and then removed. Should any hæmorrhage exist, the salt should be reapplied in the same manner, which never fails to close every bleeding vessel.

I was taught that it was dangerous to interfere with nævi at all, and particularly with cutting instruments; but so soon as I was convinced of the extraordinary hæmostatic properties of Monsel's salt, I was satisfied that the hæmorrhage could by its use be easily con-

trolled, and have never hesitated to excise them except when located near the eye, or upon the neck, and then the ligature should be preferred. Recently a child six months old was brought to the city from Siskiyou County, with an enormous tumor of this character upon the back of the neck. It being impossible to make permanent compression in that locality, an incision half an inch in length was made through the skin on each side of the base of the tumor; a large curved needle armed with a strong double ligature was passed from side to side under the nævus, and then subcutaneously so that each ligature should embrace and destroy the circulation of one-half of the tumor. The operation was so extensive for a child of that age, that a violent fever followed accompanied with convulsions. Eight ounces of blood were taken from the arm; a depressant mixture was given, and cold applied to the head; the symptoms were speedily overcome; on the eighth day the integument was detached without hæmorrhage, and on the twelfth the ligatures were removed, leaving a healthy granulating surface, which cicatrized so rapidly that in three weeks the child returned home, and it is now in good health. Four years ago I removed from the middle and inner portion of the thigh of a child two years old a nævus, which was three inches long and two in width. The tumor was raised sufficiently to allow the sharp-pointed blade of a pair of strong scissors to be passed longitudinally under it, and by closing the blades half the tumor was removed, and the remainder so soon as the position of the scissors could be changed. Lint wet and covered with Monsel's salt was applied instantaneously, and not a tablespoonful of blood was lost. The application should be secured by a bandage, and allowed to remain until it is detached by suppuration. Secondary hæmorrhage has not occurred in a single case, so that you need never hesitate to pursue this course when sufficient pressure can be made to confine the lint firmly upon the wound. The salt should be applied as speedily as possible, so that blood may not intervene between it and the extremities of the divided vessels.

The blood coagulates firmly so soon as it comes in contact with Monsel's salt; it enlarges and consequently occludes the vessels with as much certainty as a ligature. Drs. Carman and Trask of this city witnessed the first operation of this character that was ever performed, and to satisfy them of the hæmostatic properties of Monsel's

salt, in two minutes the lint was removed and not a drop of blood followed.

Other remedies have been recommended in such cases. Some resort to vaccination if the tumor be small, others advise the use of hot needles; but they both fail when the tumor is either large or the discoloration extensive. They should never be performed when an operation which is more expeditious, less painful, much more safe, and produces less deformity, can be substituted.

I have said all that I consider it necessary to say about congenital malformations, and will finish this lecture with some remarks on diseased nutrition. The action of the capillary vessels by which the texture of a part is either altered or increased in size is called diseased nutrition, and all the morbid growths thus produced are called tumors. The word tumor is applicable to every disease in which the part is increased in magnitude. When an effusion of serum takes place into the tunica vaginalis, a tumor is formed which is called a hydrocele.

The natural tissues of a part may be simply enlarged, as the periosteum in exostosis. In such cases there is an increase of the tissues, and consequently the bone becomes enlarged, but still the texture is not changed.

They may be converted into textures foreign to the healthy condition of the body, as in cancer. New formations may also be developed, as in fibrous tumors. In these there is a formation different from the original structure of the part; still it may not be prejudicial to or incompatible with a healthy condition of the body, or in other words it is neither dangerous nor necessarily fatal if allowed to remain, although an unnatural development. Such growths may occur in any portion of the body, but are more frequently located in the glands and cellular tissue.

They do not increase with any degree of uniformity. When the part is kept at rest and attention is paid to the general health, they usually enlarge very slowly, but if violent exercise be taken or irritants be applied, or should inflammation result from any other cause, then the tumor will increase with great rapidity.

They may be removed by absorption, mortification, or excision. The method most suitable for each variety will be specified when it is under consideration.

Abernethy divided tumors into sarcomatous and encysted, and

they may be subdivided into the simple or benign, semi-malignant, and malignant. There are tumors which never, no matter what magnitude they acquire or how long they remain, become malignant.

1. The simplest tumor is called vascular sarcoma. The enlargement is produced by the distension of the bloodvessels, and the effusion of serum or plastic lymph into the cellular tissue. The parts most liable to this change of structure are the testicles, thyroid gland, and scrotum. Your attention has been directed in the surgical ward to a case of enlargement of the thyroid gland, which is of that character. It is not painful, although it has enlarged rapidly, both by the increase of vascularity and by the effusion and organization of plastic lymph.

2. Warts and polypi also belong to this class; with the appearance of the former you are all familiar. They are excrescences developed upon the skin, and when exposed, are usually firm and may present either a rough or smooth surface, but when they occur upon the prepuce, the perineum of the female, or upon any other portion of the body which is kept moist by the natural secretions of the part, they are soft and flat, and are called condylomata or mucous tubercles.

The mucous polypus is of the same character, although it presents a different appearance. It is much longer and larger, being a pendulous mass of a reddish color, soft, and of a delicate texture. It may be attached to or grow from any mucous membrane, and is composed of the natural elements of this tissue. It is, however, found most frequently in the nose and the mouth of the uterus.

Treatment.—When warts are located either upon the hands or feet, or on other parts which are not very sensitive, acetic acid should be applied morning and evening until they disappear. When located upon the eyelids a ligature should always be applied. Mucous tubercles, when situated upon the glans penis or prepuce, if neglected frequently become not only excessively large but also firm and very irregular. Should they be removed by a cutting instrument, even if escharotics be subsequently applied, they will invariably return. You may burn them off with sulphate of copper, nitrate of silver, or nitric acid, and still they reappear; but if you apply a ligature sufficiently tight to destroy their vitality, they will seldom return. Until by experience I ascertained this fact, there was no simple dis-

ease that annoyed me so much. They may result from want of cleanliness, from gonorrhœa, and probably from syphilis, although I still entertain some doubts as to the possibility. Without regard to the cause, the local treatment should be the same. When they are large and numerous the ligature should include as many as can be effectually strangulated, and the operation should be repeated until they are all removed.

It is unnecessary to ligate a uterine mucous polypus; they are so delicate that they will seldom bear a ligature, and when removed with dressing forceps they seldom return. When located in the nose it is frequently impossible to find the pedicle, and if found it is exceedingly difficult to apply a ligature, consequently we are frequently compelled to resort to the very unsatisfactory operation of removing them with the forceps. Lisfranc advised his class, in consequence of their great liability to return, to do as much violence to the mucous membrane as possible with the forceps, so as to prevent that occurrence. Sometimes they do not reappear after being removed, occasionally they do return at long intervals, but generally they recur so frequently as to prove a source of great annoyance, although they never become malignant.

3. The third variety of simple tumor is well represented by the specimen exhibited. This is an adipose or fatty tumor, and was removed three weeks ago from the back of a young woman of this city. It resembles perfectly pure white fat. They are, however, sometimes yellowish in appearance. They are never painful; are not intimately connected with the surrounding parts, and contain but few bloodvessels.

They are generally rendered irregular in shape by processes being thrown out from the body of the tumor. The largest of this variety which I have ever seen was removed from the neck of an old lady, who lived at 28 Jackson Street. It had been previously removed by Drs. Mott and Parker, and returned, and when she left New York it was about as large as a man's fist; after she reached San Francisco it increased with great rapidity, and finally she was forced by its immense magnitude to submit to a third operation. It extended from the ear to the shoulder; the skin was ulcerated, which with the excessive weight induced her to adopt this course, although she had but little hope of permanent relief. The operation was performed six years ago, and every portion was carefully removed to prevent a

recurrence. The tumor weighed seven pounds; she recovered rapidly, is now well, and no deformity resulted from its removal.

Adipose tumors are very variable in size, and if upon an exposed portion of the body should be excised so soon as they are discovered, in order to prevent the deformity which must result from an extensive cicatrix. In operations upon all simple or semi-malignant tumors, you should divide everything which intervenes between the skin and tumor, and then it can be more easily removed, and the hæmorrhage inseparable from the division of the surrounding vessels avoided. When the sac is opened, but few adhesions will be found, and the tumor seldom returns. A small portion of wet lint should be placed in the most dependent portion, in order to drain it effectually, and the remainder closed by the interrupted silver suture. The warm-water dressing should always be preferred, and the patient should not be allowed to attend to his ordinary business. Always before closing the wound be sure that the tumor has been entirely removed, for another of the same magnitude will be speedily developed from the smallest nucleus.

4. *Cystic Sarcoma or Encysted Tumors.*—These are met with most frequently in the ovaries, but may occur in the testicles and mammæ. They may be unilocular or those of one cyst, or multilocular, which are composed of numerous cysts. They usually vary as much in size as they do in the character of their contents. One cyst may contain a fluid about the color and consistence of honey, another serum, a third bone, and a fourth balls the size of a large marble resembling mutton tallow, enveloped with hair from twelve to eighteen inches in length. I removed one some years since from a negro woman, which presented the peculiarities specified. The hair was straight, light-colored, and at least eighteen inches long, and the hair upon her head was black, short, and curly, there being not the slightest resemblance between them. If the contents had not been separated by distinct partitions, it might be supposed to have resulted from an extra-uterine pregnancy. They are inconvenient by their magnitude, and dangerous by their position. They as well as all other tumors vary in size. This jar contains what remains of a tumor of that character. It weighed about seventy-five pounds. It was unilocular; fifty-seven pints of serum was removed, which with the solid portion exhibited must have weighed that much.

When located in the mammæ or testicles, they do not require

special treatment, and should be removed either with or without the organ, as may be necessary. When they occur in the ovaries they are always dangerous, being beyond the control of medical treatment. An operation is required for their removal, which is extremely hazardous, and therefore should never be performed unless there exists the most urgent necessity.

5. *Encysted Tumors or Wens.*—These occur very frequently, and consist of a cyst and its contents, which may be either fluid, semi-fluid, or solid.

The first variety is called melicerous, from its resemblance to honey; the second, atheromatous, or like putty; the third, steatomatous, like lard.

In size they usually vary from the size of a pea to that of a walnut, although they sometimes become much larger. The cyst is generally firm, and contains the substances already specified. They are usually located immediately under the skin or mucous membrane, and are found most frequently under the scalp, although they may occur upon any portion of the body. For a time they are not connected intimately with the skin, are usually oblong, and resemble an egg in shape. They are always movable, except when the sac becomes inflamed either by violence or excessive distension; then they become fixed, and their removal is more difficult. Sometimes the sac and integument both ulcerate, the contents escape, and an ulcer remains, which can only be healed by removing the remainder of the cyst. The ulcers produced in this manner are supposed to give origin to the horny excrescences met with and described. A very remarkable production of that character is represented by a woodcut in Syme's work on *Surgery*. It was more than six inches in length, and nearly an inch in diameter. As these tumors are simple, and never return when entirely removed, excision should always be recommended before they become sufficiently large to give much inconvenience.

The most expeditious method of operating is to make a free incision through the skin and sac, and when the contents are removed, to take hold of the edge with strong artery or dressing forceps; if located on the head, the use of the knife is entirely unnecessary. When situated elsewhere, and more or less intimately connected with the surrounding parts, the sac should be opened and dissected out, because by pursuing that course the external wound required is

much less extensive, and should never be healed by the first intention. When on the scalp and covered by hair, they need no dressing, but when on the face, neck, or forehead, they should be partially closed by the interrupted silver suture, with a small portion of wet lint placed in the most dependent portion of the wound, and the water-dressing applied.

When a wen is located upon the centre of the neck, between the larynx and chin, make an incision through the skin where elevated, which will expose the tumor. Should adhesions exist, destroy them with the finger or handle of the scalpel, and apply a ligature upon the base, otherwise hæmorrhage may follow, as was the case many years since in one of my operations. The tumor was removed late in the afternoon, and a branch of the inferior thyroid of the right side was divided; a ligature could not be applied at night, consequently the hæmorrhage could only be controlled by the application of spring acting forceps, which were allowed to remain during the night, and removed the following morning by torsion, without being followed by a return of the hæmorrhage.

Since that occurrence, in all operations upon deepseated tumors upon the neck, in order to prevent hæmorrhage, both arterial and venous, from regurgitation, I always apply a strong ligature between the tumor and its deep attachment, and have not since been troubled with hæmorrhage. The ligature also serves to drain the wound, which is very important in that locality.

6. The tumors described as neuromatous and subcutaneous tubercle are so nearly alike in location, appearance, and symptoms, that I have never been able either before or after their removal to discover any difference. They sometimes acquire considerable magnitude, are always exceedingly painful, and interfere with the function of the nerve involved. They differ from every other variety of simple tumor in that respect, but more particularly in the excessive sensibility of the surface which always exists. A few weeks since I removed a tumor of this character from the ankle of a lady of this city, which although not larger than a buckshot, had been for more than a year a source of constant torment. She could not bear the bed-clothes to touch that side of the leg, consequently her sleep was always more or less disturbed. Twenty years ago I removed a tumor of this character as large as a chestnut from the left side of the chest of an old gentleman, who had not been free from

pain for many years. Besides being painful, it was so excessively sensitive, that he was compelled to protect it from his clothes by wearing a ring made of cloth and cotton, about three inches in diameter and an inch thick, which was kept in its position by a shoulder-strap and bandage. In such cases the patient should be rendered insensible by an anæsthetic, the tumor removed as speedily as possible, and the wound treated as if it had resulted from any other cause.

7. *Hydatid.*—A cyst which incloses a vesicular worm is called a hydatid. It is a parasite, and each worm or echinococcus consists of a distinct head and body, and is furnished with teeth that can be seen distinctly with a microscope. When they occur in the liver they may prove fatal; occasionally, however, suppuration takes place, and if it be allowed to escape through a large external opening, the hydatids may accompany it and the patient recover. The specimen exhibited is the most perfect I have ever seen. It existed in the uterus, was accompanied with all the symptoms of, and was mistaken for, Bright's disease of the kidneys. The urine was highly albuminous, the sight was impaired, all the cavities were partially filled with serum, and she was excessively feeble. Her case being considered hopeless by her physicians, I was requested to see her, and upon inquiry I found that she had not menstruated for four months, and there being a decided enlargement and induration in the hypogastric region, a sound was passed into the uterus with the view of producing expulsive pains sufficient to remove the contents, and the following evening the specimen which I present was extruded. In a few days the albumen disappeared from the urine, the serum effused was speedily absorbed and eliminated, and her health was soon restored. In twelve months after she was relieved of this difficulty I delivered her of a healthy child, which is still in good health.

According to this classification there are seven simple or benign tumors, which when entirely removed do not return, and become injurious and troublesome only by their size and location.

The next lecture will be devoted to semi-malignant and malignant tumors.

LECTURE X.

Semi-malignant tumors include the fibrous and epithelial. The former are divided by Syme into the tubercular, pancreatic, and fibro-cartilaginous. More recent pathologists have described other varieties, which are arranged under the following heads: 1st. Fibrous. 2d. Malignant fibrous. 3d. Recurring fibrous. 4th. Fibro-plastic or enchondromatous. 5th. Keloid.

The surface of fibrous tumors is generally irregular, although the specimen I now exhibit is almost perfectly smooth. They also vary in density from the firmness of cartilage to the consistence of the pancreas. The size, as in all other tumors, is exceedingly variable. They generally present a gray or yellowish appearance; when divided with the knife they impart a gritty sensation to the hand. A section presents a whitish hue, and is composed of ligamentous tissue and nucleated fibres. They are surrounded by what appears to be a capsule, which is firm and strong, and composed of condensed cellular tissue.

When the material of the tumor is deposited, the cellular tissue envelops it closely, and when thickened by pressure is called a capsule. These tumors may remain almost stationary, or increase very slowly for many years; if small they are only inconvenient, but when large they may prove fatal by deranging the functions of the important organs in the vicinity, without the tumor having undergone any decided structural change. After a greater or less period, however, it usually happens that disintegration commences internally, the structure becomes changed, and the skin finally inflames, ulcerates, and the fluid contents escape, leaving a rough, fungous, bleeding ulcer of a character so malignant that all the constitutional symptoms observed in cancer speedily become apparent. Occasionally these tumors soften in the centre; the solid structure disappears, leaving a cyst, filled with a fluid which is not uniform in color, and which may be mistaken for an ordinary cystic tumor.

The malignant fibrous tumor resembles in every respect the one I have endeavored to describe, and we become convinced of a difference only by the decided tendency to return.

The fibro-plastic tumor was first described by Lebert in his splendid work on pathology. He thinks it occupies a position intermediate between the fibrous and fibro-cellular. They present the fibrous structure with fibro-plastic cells and elongated nuclei; when divided they present a shining moist appearance, and the surface is discolored by spots that may be red, pinkish-brown, or livid. They resemble flesh, are not tenacious, occur most frequently in young people, and are generally located either in the bones, on the neck, face, or mammæ. When removed they occasionally return.

Recurring Fibroid Growths.—We are indebted to Paget for a correct description of these. In appearance they resemble the common fibrous tumors, but their minute structure is of a fibro-plastic character; the microscope reveals the existence of very narrow, elongated, caudate, and oat-shaped nucleated cells, many of which have long and subdivided terminal processes. This variety is exceedingly liable to recur, and the malignancy appears to increase after each excision, although the third or fourth operation has occasionally proved successful.

Enchondroma.—This is not uncommon, and presents two varieties. The first and most simple never becomes large; it increases very slowly and is never painful. It presents a smooth, firm, round, and flattened or ovoid appearance. It occurs usually in the small and short bones, as the phalanges of the fingers.

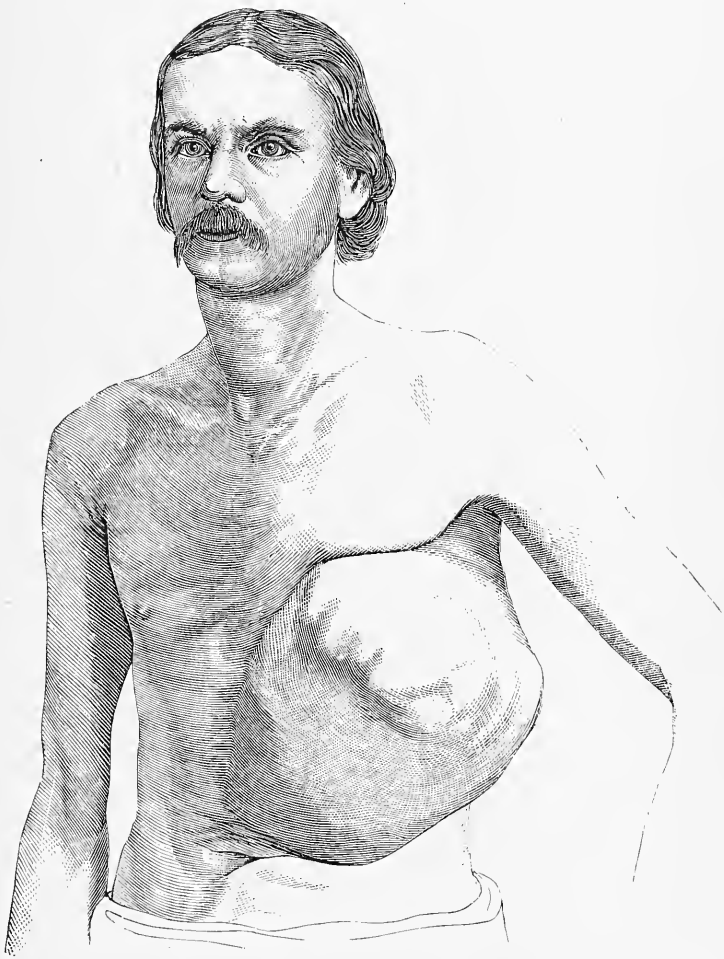
In the other variety the tumor increases with great rapidity, and often in a few months becomes enormously large. They sometimes ossify at one point, whilst they become less consistent at another, and ultimately the skin inflames and ulcerates, as in the other varieties, through which a fluid resembling jelly escapes in greater or less abundance, according to the extent of the cavity. The following are the microscopic appearances given by Erichsen in his valuable work on *Surgery:* "The plate shows a distinct matrix, in places dimly granular, in others slightly fibrous, imbedded in which are cells and nuclei of various forms and sizes, some round or irregularly oval, from $\frac{1}{200}$th to $\frac{1}{500}$th of an inch in diameter; many are branched or caudate. Some of the spheroidal cells are granular, others have nuclei of irregular outline, and interspersed amongst them are a few oil-globules. The general appearance is that of fœtal cartilage, from which it can with difficulty be distinguished." Fibrous tumors cannot easily be mistaken for those of a different

character. They are more firm and less movable than the encysted, and differ in shape, locality, and consistence from the fatty, are less hard and painful than the scirrhous, are not so rapidly developed, and are less elastic than the encephaloid, colloid, and melanotic tumors. The most common location is in the vicinity of the parotid gland, although they frequently occur in the antrum Highmorianum, or mammæ, as well as upon some other portions of the body. I have removed three large fibrous tumors that were located between the abdominal muscles and peritoneum. One was situated above the umbilicus on the left side. The peritoneum was removed with the tumor, in consequence of the union being so intimate that they could not be separated. In the other cases the tumor was located upon the right and lower portion of the abdomen; each weighed about four pounds; they were removed without the peritoneum being injured, and in all with the most satisfactory result. The fibrous tumors which I exhibit resemble one another very closely both in size and appearance. This was a uterine polypus, and was removed by Dupuytren's knot-tightener, to which a strong silver wire was attached, and that an ovarian tumor, which was removed at the request of the patient by making an incision through the abdominal parietes directly over the tumor, which when exposed was detached from the surrounding parts, and after the pedicle was ligated it was removed. Both the pedicle and ligature were allowed to remain externally, and the patient not only recovered, but has since given birth to two healthy children.

This sac contains a fibro-cartilaginous tumor, which is usually called enchondroma. This is a correct likeness of the brave but unfortunate young man, which was taken only a few days before the operation was performed. The tumor extended from the umbilicus to the axilla, involved four ribs, and weighed sixteen pounds. Inferiorly it was located between the abdominal muscles and peritoneum, from which it was with great difficulty detached. When that part of the operation was completed, I found that four of the ribs were involved, being greatly enlarged, cartilaginous, and constituting the greater portion of the superior two-thirds of the tumor. When they were removed the cavity of the chest was necessarily exposed, and the left lung collapsed. Neither the peritoneum nor pleura were wounded, but the latter sloughed some days afterward, so as to expose the heart. I entertained strong hope of his recovery

until peritonitis occurred, which proved fatal on the sixteenth day. For thirteen days his appetite was good; the action of the heart was but little increased. He breathed easily, and was always cheerful

Fig. 33.



and comfortable, until at the time specified he was attacked with acute pain in the abdomen, accompanied with vomiting, a small rapid pulse, and all the symptoms of acute peritonitis. This case was published in the *Pacific Medical Journal* with all the necessary details.

Disintegration has commenced in the inferior portion of the tumor, but the remainder presents all the peculiarities of an enchondroma.

Recently I removed in this city a tumor of this character, which involved the lower two-thirds of the scapula, as well as a large encephaloid growth, which extended into the axilla. The cartilaginous tumor made its appearance twenty years ago, in the State of New York; it was then removed, and until recently the patient considered himself permanently relieved. After it made its appearance the second time it not only increased rapidly, but also became excessively painful. To the anterior portion of the tumor was attached an encephaloid, which was painful in consequence of the distension of the muscles under which it was situated. The wound healed readily, and in about six months he returned with an encephaloid tumor larger than the one which had been removed. That was operated upon, as there had been a great improvement in his general health, and a few days since I had the pleasure to meet with him in my office in perfect health, a year and a half having elapsed since the last operation was performed. The last tumor removed was pronounced encephaloid by the best microscopist of our city.

Treatment.—Many fibrous tumors can be removed, provided the operation be performed before they assume a malignant character, and will not return. When an entire bone is implicated, the diseased part should be removed, even if a whole extremity, the superior or inferior maxillary bones, the clavicle, or even the scapula be involved.

Keloid.—These have been so called in consequence of their supposed resemblance to a crab. Being more intimately connected with fibrous than any other variety of tumor, and as they occasionally become malignant, they very properly occupy the position in which they are placed. In structure they resemble the fibro-plastic tumor, and vary in size from that of a chestnut to a man's fist, and generally they increase more rapidly in length than in magnitude. They resemble both in appearance and firmness the cicatrix of a burn, and when a strong predisposition exists to this disease, all that is necessary to produce them is to remove the cuticle. Negroes, who have a smooth, soft skin, are much more liable to this disease than any of the other varieties of the human family. Before leaving South Carolina I examined a healthy young colored man, whose body was covered with them, wherever the skin was subjected to

the friction of the suspenders, the waistband of the pantaloons, or the contents of the pockets, or was accidentally injured. In California it is a very rare disease; I have met with only one case in the State. I treated a case in South Carolina in which a tumor of this character became cancerous, and ultimately proved fatal after being several times removed.

Keloid is not amenable either to internal or external treatment. The first case of this character upon which I operated, resulted from the introduction of a seton in the back of the neck. The tumor was carefully removed, the wound was closed by the interrupted suture, and in five or six days the union was perfect, but from that time the cicatrix appeared gradually to widen and enlarge, and in two months a tumor existed larger than the one previously excised. I then determined never to interfere with such tumors again, and consequently have always refused to subject such patients to surgical treatment.

Epithelioma or *cancroid* is usually located either upon the skin or mucous membrane, and occurs most frequently on the under lip, the nose, eyelids, upper part of the face, scrotum, anus, and uterus, although it appears occasionally upon every portion of the body. It sometimes commences upon the under lip as a simple fissure, which deepens gradually; the edges become indurated and everted, and the surface presents an unhealthy appearance. Occasionally a dark scale appears upon the nose or upper part of the face, particularly of old people, which, if irritated, rapidly increases in size until it presents the appearance above indicated. More frequently, however, a small firm tubercle appears, which soon ulcerates, and although it may spread very slowly, will ultimately, if neglected, involve the lymphatic ganglia in the vicinity, which is soon followed by the cancerous cachexia, which indicates the existence of an incurable constitutional disease. The basis of these tumors is fibrous, to which the condensed, numerous and morbid epithelial scales closely adhere. In appearance the scales resemble those of the epidermis, with the exception that their arrangement is different. Sometimes these scales are intermixed with globular bodies, and in other cases with cells which resemble those of true malignant cancer. The treatment of epithelioma is exceedingly satisfactory, except when it has been neglected until the ganglia in the vicinity have become enlarged and indurated, and the cancerous cachexia has made its appearance, for the removal of which no remedy has yet or will most probably ever

be discovered. When external they should be removed with the knife, provided that can be accomplished without incurring the risk of a fatal hæmorrhage. I repeat, that the treatment of epithelioma is exceedingly satisfactory, even when the under lip, the eyelids, and other important portions of the body are involved; if properly removed they seldom return. When located upon the under lip, and not more than an inch is implicated, a V-shaped portion, including the tumor, should be removed, and the wound dressed as directed when the operation was described. Should it become necessary to remove so much of the lip as to render the mouth inconveniently

Fig. 34.

small, it may be enlarged, and the wound of the under lip covered with mucous membrane by dividing the latter a quarter of an inch higher than the integument and muscles, which should be placed

and secured under the everted membrane until it adheres. This operation was performed upon one of the graduates of our college six years ago with the most satisfactory result.

Fig. 35.

Fig. 36.

When the entire lip is involved, which is not unfrequent, it should be removed, and the deficiency supplied either by dissecting up a portion of the integument in the vicinity, corresponding in shape with that removed, or by detaching the skin from the chin and superior portions of the neck to the width of that removed, and elevating it sufficiently to supply the deficiency. By examining Figs. 34, 35, 36, 37, you can form an idea of the probable result of such an operation when properly performed.

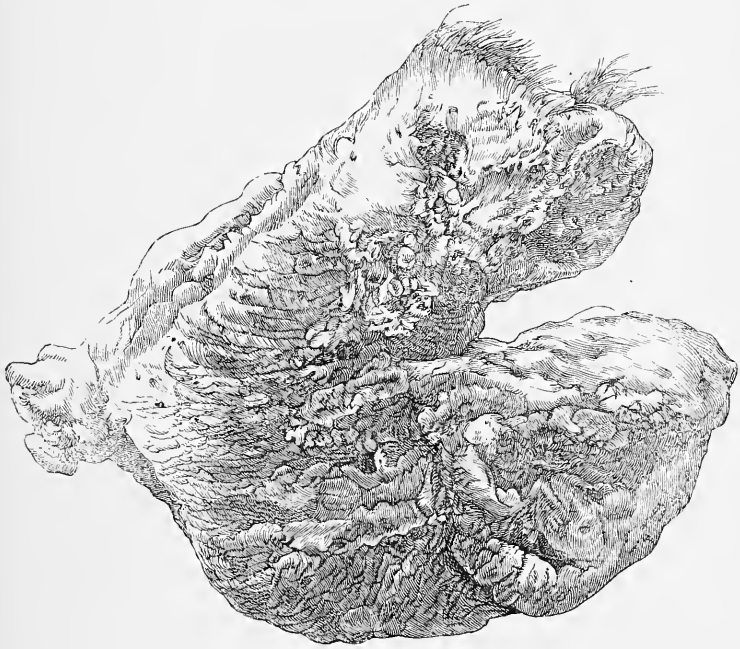
Fig. 37.

In Fig. 34 the flap was taken from one side of the face, the size being determined by a pattern cut out of blotting-paper after the diseased portion was removed. The extremity of the flap sloughed, although a sufficient quantity remained healthy to remove the de-

formity. The photograph was taken only a few days after the operation was completed, and before the tumefaction subsided.

In Fig. 36 the entire lower lip was removed, and a flap was raised from each side, and united in the centre and inferiorly. This patient after the operation disappeared for fifteen days, lived as usual, and when he returned, even under such disadvantages the union was complete. It is always better to remove the pedicle as close to the face as possible, and allow the wound to heal by granulation, than to replace it after it has been reduced to the proper size and shape

Fig. 38.



to supply the deficiency. The sutures should neither be removed, nor the operation completed before the seventh day, lest the entire flap may slough, and a failure result.

In Fig. 37, the upper and lower lips were both implicated, and the flap was taken from the side of the face; but notwithstanding the operation was followed by erysipelas, the entire wound healed by the first intention, and when the operation was finished, but little

deformity remained. The result in this case was not only gratifying, but also very extraordinary, and proves conclusively, that in California plastic operations will succeed as well as in any other climate or country, when skilfully performed, although a contrary opinion has not only been expressed, but also published in a medical journal of this city.

In Fig. 39 the tumor involved the entire under lip of a man

Fig. 39.

seventy-nine years old. After it was removed a perpendicular incision downward was made on each side, and the skin dissected up to a sufficient extent, when raised and secured by sutures, to supply the deficiency; in five days he returned to his friends, and but little if any deformity resulted from the operation.

Fig. 40 represents another case in which the lower lip was removed (Fig. 41), and a flap raised from either side to supply the deficiency.

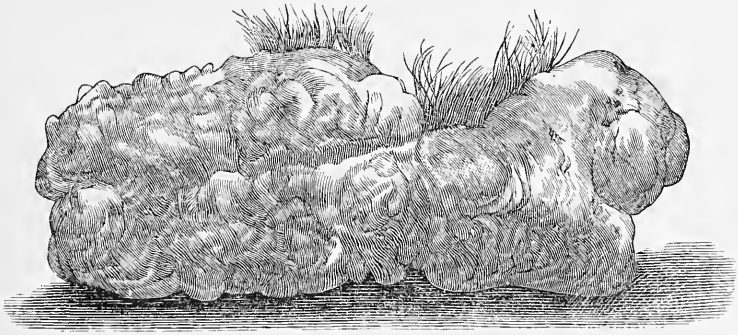
In Fig. 43 you will find the result of an operation to replace the eyelids destroyed by an epithelioma (Fig. 42). The flap was taken

from the temple, and adhered perfectly; the eyeball was covered and protected, although the upper lid is unnaturally low, which would have

Fig. 40.

been relieved if erysipelas had not followed the second operation, and rendered the postponement of the effort necessary. These cases have

Fig. 41.



all been published in the *San Francisco Medical Journal*, with the necessary details, and are only a few of the plastic operations which I have performed in California to remove deformities, and which have

invariably been successful. The result is attributable not only to the fact that the flap was always made so long that strangulation was rendered impossible, but also to the use of the warm-water

Fig. 42.

dressing, and to the silver sutures being allowed to remain from seven to ten days before the flap was detached and the operation completed.

Malignant Tumors.—Tumors of this character, even if treated early and properly, have not only an inherent and decided tendency to return, but their composition is different from that of any of the healthy tissues of the body. They present four varieties.

1st. Colloid or gelatinous.
2d. Encephaloid or soft.
3d. Scirrhus or hard cancer.
4th. Melanosis.

Colloid.—This variety is rare, and I can present but one specimen. It derives its name from its resemblance to glue, and is composed of small and distinctly formed cells with the fluid already specified.

FIG. 43.

It seldom acquires the magnitude of an encephaloid, increases less rapidly, and is not so liable to return.

The specimen exhibited was removed from the base of the tongue of a young man from Calaveras County, in this State, six or seven years ago, with an écraseur (Figs. 44, 45). To prevent, as I supposed, the possibility of hæmorrhage, the lingual artery was ligated a week before. The tongue being placed under the control of the surgeon, by passing a strong ligature through the centre from below upward, a transverse incision was then made, commencing an inch from the extremity and terminating at the median line, and then a perpendicular

incision, commencing at that point, extended to the base. The ordinary écraseur was then applied, as represented in Fig. 45, and half a turn of the screw made every thirty seconds until the tumor was detached. In about two hours hæmorrhage supervened from the

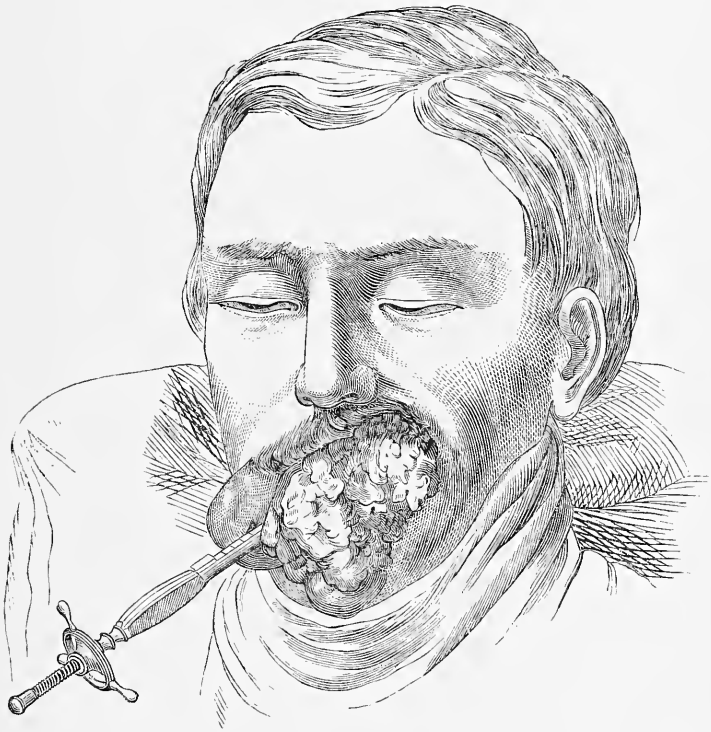
Fig. 44.

anterior portion of the tongue, furnished by the vessels of the opposite side, which it required the use of the actual cautery to control. At the expiration of two years a tumor of the same character made its appearance upon the opposite side of the tongue, involving the base of the entire organ, and was removed by a strong ligature placed below the tumor by the use of a large curved needle, after the cheek, from the angle of the mouth to the last molar tooth, had been divided. On the sixth day the entire tongue sloughed, and the patient, who was too brave to deserve such a fate, died on the tenth day, which is probably as favorable a result as can be expected from such an operation. This case was published in the *Pacific Medical Journal.*

Encephaloid or Medullary Sarcoma.—The term encephaloid is

employed in consequence of the striking resemblance of the substance of these tumors to brain, both in appearance and chemical composition. In color it is either white or reddish. Numerous septa exist, and the contents of the cavities vary in density. These tumors occur frequently in young persons, and then increase in size very rapidly. They are always elastic, and the superficial veins some-

Fig. 45.



times become greatly enlarged. The elasticity is often mistaken for fluctuation, and an incision made suitable for opening an abscess. A case occurred recently in this city from a contusion on the hip, and when the tumor was removed three months afterwards, it weighed seven pounds and three-quarters, and had been opened by a physician who mistook it for an abscess.

This is an exceedingly malignant tumor, as much so as scirrhus, and much more rapid in its development. I always operate in such

cases with great reluctance, as the disease has, except in one instance, always returned. You will find numerous specimens of this morbid growth in the museum of the college. When removed, the disease usually reappears externally, although occasionally some internal and vital organ becomes implicated.

Scirrhus, or carcinomatous sarcoma, occurs very frequently, and derives its name from its excessive hardness. The induration is not, however, after the tumor has existed for several months, uniform. These growths are not only very firm and heavy, but also excessively painful. The surrounding parts soon become implicated, and particularly the lymphatic ganglions. The skin generally adheres firmly to the tumor, finally ulcerates, and then it is called an open cancer. Its progress is less rapid than encephaloid or melanosis, but its consequences are equally serious. After ulceration takes place the skin assumes a dark leaden hue, which is proof positive that the disease has become both constitutional and incurable.

The fourth and last variety of malignant tumor is melanosis. This jar contains the best specimen I have seen. It is irregular in shape, and nearly black, from which peculiarity it receives its name. The small tumor exhibited was developed on the wrist; the large one subsequently came in the axilla of the same side, and increased with as much rapidity as an encephaloid. They were both removed at the same time, and the patient went home apparently relieved, but the disease returned in the cavity of the thorax, and speedily proved fatal. These tumors differ from the other varieties in color; they generally occur in the decline of life, and are always incurable. Microscopists think that every variety of malignant tumor is composed of the same elements, although differently arranged, and variable in proportion. "In all there is a fibrous stroma or basis, firmer and closer in some," as in scirrhus, than in others. This yields by pressure or scraping a turbid juice, termed the cancer-juice, in which granules, cells, pigmentary and fatty matters are found in varying proportions. The granules are minute, sometimes amorphous, at others presenting that peculiar vibratory condition termed the molecular movement; they are met with in all the varieties of cancer, although they occur in the largest quantities in scirrhus. The cells, to which great importance has been attached by various observers, and which have often been looked upon as characteristic or pathognomonic of the disease, though erroneously so in the strict acceptation

of the term, present, however, such peculiar appearances that it is almost impossible to mistake them. They are large, spherical, fusiform, or spindle-shaped, elliptic or caudate, having often two or three terminations, are usually compound, granular, have large nuclei, and prominent well-marked nucleoli. These appearances are presented by them in all forms of the disease. It is, however, more especially in the encephaloid variety that they assume a large size, and present their most marked fusiform and caudate shapes.

The pigmentous cells are principally if not altogether found in melanosis. The value of these microscopic investigations is differently estimated by surgeons, and I must confess that from the mistakes made by the professed microscopists of this city, I place more confidence in a diagnosis derived from the external indications combined with the constitutional condition of the patient, than from the microscopical appearances, even when observed by the most experienced. An able surgeon rarely commits an error in diagnosis, but either microscopists often err, or these tumors are not as malignant as surgeons generally believe.

Treatment.—This should be both general and local. The constitutional remedies are confined to those which are calculated to relieve pain, allay irritation, support the strength, and thereby prevent the rapid increase of the local difficulty. A mild but nutritious diet should be prescribed, and stimulants avoided, except where great prostration exists. Opium or some of its preparations should be administered freely at night, in order that sufficient sleep may be obtained. Should the preparations of opium when taken into the stomach have a contrary effect, then it should be applied either endermically or hypodermically as the patient may prefer, or codeia, hyoscyamus, lupulin, or brandy should be substituted. The latter is in some cases the best narcotic that can be administered. Pain must be relieved, and sleep procured, in order to arrest the progress of any disease, whether it be simple or malignant.

The local treatment is much more important than the constitutional. The part should be kept at rest, and in the most favorable position. No applications should be made, except those which soothe without irritating the integument. If the vessels in the vicinity are distended, accompanied with the other indications of inflammation, a few leeches may be applied advantageously, but not to the tumor. Counter-irritants should be avoided, and the extract of either stra-

monium or belladonna, or the soap and lead plaster substituted. After ulceration has occurred the part should be dressed twice in twenty-four hours, and the disagreeable smell removed by the use of three ounces of the chlorate of potash to a quart of water, Labarraque's solution of the chloride of soda, the permanganate of potash, or carbolic acid. I prefer the chlorate of potash, because it is less unpleasant and equally effectual.

Escharotics have been and are still employed for the cure of cancers. The articles used are mineral acids, caustic potash, and arsenic. Except the acids, the best is zinc paste, which is composed of equal parts of chloride of zinc and flour, and should be allowed to remain twenty-four hours, during which time it will destroy an inch and a half in thickness. Arsenic is the active ingredient in most of the local remedies used to cure cancer. It is exceedingly dangerous, and should never be prescribed.

In small superficial epithelial ulcers located upon the nose or face, nitric acid or the acid nitrate of mercury may sometimes be used successfully, but generally the knife is decidedly preferable to any other remedy, and should be resorted to before the disease becomes constitutional. When the lymphatic ganglions are enlarged and indurated, or when more than one tumor exists, I would advise you never to use the knife except with the understanding that it can only afford temporary relief. Should either the cancerous diathesis exist, or it be impossible to remove the entire morbid growth, then do not recommend an operation, and only perform one at the earnest solicitation either of the patient or his friends, because when the disease returns they are always dissatisfied if an operation has been recommended.

LECTURE XI.

GENTLEMEN: To-day we have before us one of the most difficult and important subjects in Surgery, and one that should interest every member of the class. Scrofula prevails everywhere; the inhabitants of the East and West Indies, according to Major McCullough's report, being more obnoxious to the disease than those of British America, or any portion of Europe. It may be defined as a peculiar constitution, which, when fully developed, is characterized by the formation of tubercle. All who inherit this peculiarity of constitution, which is called the scrofulous diathesis, do not suffer from its consequences, but may escape by proper management even when the predisposition is decided. I know a lady in this city, who lost her mother by consumption, in whom the predisposition was strongly marked from the period of her birth until she was fully matured. The lymphatic ganglions of her neck were enlarged, she suffered occasionally fro n ulceration of both the corneæ and tonsils, as well as from other evidences of constitutional debility, yet by constant care, and prompt and proper treatment, the difficulty was overcome, and she is now the mother of seven children, and in the enjoyment of perfect health.

The scrofulous diathesis should not be confounded with a general delicacy of constitution. We often meet with persons who are thin, delicate, and irritable, but otherwise healthy. They are not predisposed to scrofula, but have inherited the nervous temperament, which is exceedingly common in large cities. Bérard in his lectures on physiology stated to the class, that if it were not for the emigration to Paris from the provinces, all the inhabitants of that city would in three or four generations present the peculiarities characteristic of the nervous temperament. The human race deteriorates both physically and mentally in large cities, and consequently becomes more liable to scrofula. There are certain indications by which you can determine the existence of this predisposition. The strumous constitution or peculiarity assumes two distinct forms, and they present each one variety.

In the first and most common form the physical development is sometimes extraordinarily perfect, but usually it is rather delicate. The subjects of it have light hair, fair complexion, florid cheeks, white teeth, and mentally they are generally precocious.

In this variety the skin is white and exceedingly coarse, and there is a tendency to acne. The fingers are large and blunt, and seldom well formed, although they may possess great strength. The eyes are usually gray and the hair curly. In persons of this temperament, when tubercles are developed, the disease runs its course with great rapidity.

It is generally believed that scrofula is confined to persons of fair complexion, etc., but that is not true, for you will frequently meet with those of a dark complexion, black hair and eyes, who present the same predisposition.

In the second form we include persons who are dark, with black eyes, and are exceedingly sprightly, intelligent, and even precocious. In this variety the skin is dark and rough, the eyes are black and dull, and they are remarkable neither for physical strength nor intellect. Whenever the strumous diathesis is decided, and the skin fair, upon inquiry you will find that the digestive organs are weak, and the tongue presents the pipped or strawberry appearance, so called from the existence near its root of numerous red pimples. The edges of the organ are red, and the bowels irritable; there is often troublesome diarrhœa. Persons with a dark complexion who are predisposed to scrofula, frequently suffer greatly from constipation, and the peculiar appearance of the tongue described rarely exists. Occasionally, however, the rough jagged appearance of that organ may exist in other than scrofulous subjects, but it is almost always indicative of derangement of the digestive organs. Scrofula appears most frequently in the skin, mucous membrane, bones, and joints. In this city every physician who has an extensive practice will meet every day with fair, light-haired children, who have eczema of the scalp, which is always of a scrofulous character, and frequently when neglected extends to the entire body. In other cases ulcers exist, with bluish elevated edges, and present an unhealthy and flabby surface, which secretes the variety of purulent matter described when that fluid was under consideration, and they always heal with great difficulty. They frequently exist on the neck of a child which presents the usual indications of good health. The face

may be large, plump, and florid, but you can always find other evidences of scrofula. When the mucous membrane is implicated, there is frequently a discharge from the ears, a thickening of the mucous membrane of the nose, an enlargement of the tonsils, prolapsus ani, a vaginal discharge, or inflammation of the eyelids. If the latter be neglected, the lids may become either inverted or everted, with a loss of the eyelashes, and even of vision, and it always produces permanent deformity. Scrofulous affections of the bones and joints are exceedingly common in California, and commence in the cancellated structure of the bone, which constitutes caries, or in the periosteum, which usually results in necrosis. When this disease attacks the joints it is called white swelling, which may be simply an inflammation and thickening of the synovial membrane, or it may extend to ulceration and disorganization of that membrane, as well as of the cartilages and of the extremities of the bones.

The enlargement of the lymphatic ganglions is so frequent that it was formerly supposed to constitute and represent the disease, the other varieties being attributed to some other cause. They sometimes, especially upon the neck, become so enormously enlarged as to produce suffocation. The testicles frequently become implicated, and the enlargement is always characterized by excessive hardness. The organ becomes irregular in shape, and sometimes the epididymis is more diseased than the gland itself, although they both finally become implicated. Suppuration ultimately takes place, and a long and properly directed course of treatment is required to prevent disorganization, and consequently a destruction of the function of the organ.

Having enumerated the less important diseases which result from the scrofulous diathesis, I will now direct your attention to tubercle, the formation of which is an evidence that it has reached that too often fatal point.

It is called scrofulous sarcoma, and was not mentioned in my lectures on tumors because it requires an entirely different course of treatment. It presents two varieties; in one there are granules, which are hard, smooth, and bear a striking resemblance to cartilage. They are closely connected, arranged in groups, and are not much larger than the head of a pin, and consist of what is called "modified exudation-matter; there are abundant indications of inflammatory action in the vicinity, and they have a decided tendency

to unite and form the common yellow tubercle, which presents a grayish-yellow, gritty, semi-organized mass. It imparts a gritty sensation to the knife when cut, and after it has existed for a considerable time it breaks down, leaving a cavity, which secretes a curdy, unhealthy fluid. These deposits are found most frequently in the lungs, although they are occasionally met with in the brain, upon the mucous membrane of the intestines, in the bodies of the vertebræ, the extremities of the long bones, and, indeed, there is not a tissue or organ of the human body, whether external or internal, in which tubercles may not be deposited. The microscopic characters are not very decided. According to Erichsen, they consist of a homogeneous stroma, a granular matter, which is principally met with in yellow tubercles, drops of molecular oil, and, lastly, considerable quantities of imperfectly developed exudation-cells, often angular or broken on one side, more or less disintegrated, stationary, or degraded. Indeed, we must often recognize tubercle by its negative rather than its positive characters, by ascertaining what it is not, and so by a process of exclusion arriving at its true nature. It is easily confounded with pus, from which, however, the appearances differ sufficiently to avoid error if a little care be taken."

This disease may appear at any age, from four months to as many score years. In California some variety of scrofula may be met with every day in children three or four months old, but usually strumous ophthalmia, enlargement of the tonsils, etc., occur most frequently from one to four years of age, although it may appear at any subsequent period, and tubercular phthisis may not, even when there is a constitutional predisposition, prove fatal before the age of sixty-five or seventy years. Two members of the same family, with whom I was intimate, died of consumption, one at sixty and the other at sixty-seven years of age. They lived well, and when young took daily active exercise, and the disease was only developed when age had rendered them indolent.

The milder forms of scrofula are more frequent in childhood, but the tubercular form generally occurs between sixteen and thirty, and more persons die at twenty-eight than at any other period of life.

Causes.—The most fruitful cause is unquestionably hereditary predisposition, or in other words constitutional peculiarity, the indications of which have already been described, and they may be

so decided that they cannot be counteracted by any means that can be adopted. Some suppose that the children of dyspeptic parents, of those either not fully matured or far advanced in life, are more frequently scrofulous than those born under more favorable circumstances.

A very common exciting cause is improper food. It may not contain sufficient nutriment, or it may be so difficult of digestion as to be incompatible with good health. Sometimes by overfeeding the digestive organs become deranged, diarrhœa supervenes, and the same effect is produced that might be expected to result from the absence of nutriment. Insufficient clothing should also be mentioned as a very common exciting cause, particularly on this coast. Here we really have no summer. The skin, unless it be well protected during the prevalence of the trade-winds, ceases to perform its functions. The digestive organs become deranged; and this is all that is necessary to produce the disease in those who have either inherited the predisposition or acquired it by being exposed to the causes which have or will hereafter be enumerated. The want of abundant air and light, particularly if combined with cold and moisture, is in all cities an exceedingly prolific cause of disease of this kind. The children raised under such circumstances are delicate, small, and exceedingly liable to the various milder forms of scrofula, as well as to curvatures of the spine, to disease of the hip-joint, and when more advanced to tubercular consumption. In scrofula there is always defective nutrition. The digestive organs, therefore, perform a very important part both in the development of the disease and in its arrest and eradication after it has supervened.

Treatment.—Various remedies have been recommended in the treatment of scrofula, but they are not all equally efficacious in the different varieties, and during their use the strictest attention should be paid to hygienic regulations. The clothing should be warm, and during the summer months on the Pacific coast chamois leather should be worn over the flannel, especially if the digestive organs be decidedly deranged. The diet should be light and nutritious, and taken only in such quantities as can be easily digested. Rice, milk, eggs, white meat, boiled fish, and the ordinary farinaceous substances should be prescribed so long as the bowels are irritable, and all alcoholic stimulants should be excluded from the treatment.

When this difficulty has been overcome, then a suitable quantity of more nutritious food should be allowed, not oftener than four times in twenty-four hours, for there is nothing more injurious to children than to allow them to take nourishment before the digestion of a previous meal is completed. A small quantity of good port wine after meals should be prescribed. The exercise should be suited to the strength of the patient, and, when possible, taken in the open air. And even a change of residence sometimes becomes necessary, particularly if the elevation be increased to from 1500 to 2000 feet above the level of the sea, which climate appears to exert the most favorable influence upon the digestive organs. Warm salt-water baths are also very beneficial, provided proper precautions be taken to insure reaction, without irritating the skin by excessive friction with coarse towels or other abominations in the shape of hair gloves, straps, and brushes.

When the digestive organs of scrofulous children are deranged, especially if diarrhœa exists, and the tongue is furred, with red edges, half a grain of calomel should be given at night, until the secretions of the liver and the mucous membrane of the intestinal canal become healthy, and then the following preparation, if proper attention be paid to diet, will be found exceedingly beneficial. This prescription is intended for a child four years old.

℞.—Bismuthi Subcarb., ... ʒij.
Tinct. Nucis Vomicæ, ... ʒiss.
Syr. Zingiberis, ... ℥j.
Syr. Simplicis, ... ℥iij.
M. Sig. Take one teaspoonful four times a day.

The dose may be increased or diminished according to the age of the patient; the dose for an adult being four times as large as that for a child four years old, which has been already given.

Scrofulous children with dark complexions are very liable to strumous ophthalmia, as well as to an enlargement of the lymphatic ganglions of the neck, both of which are accompanied with constipation of the bowels. In such cases I have found the following prescription superior, as a laxative, tonic, and alterative, to any combination of remedies I have ever administered. This prescription is intended for a child four years old.

℞.—Ext. Sennæ Fl., ... ℥iv.
Tinct. Nucis Vomicæ, ... ℥iss.
Tinct Aconiti Rad.,
Ac. Hydrocyan., āā . . . . . gtt. xv.
Syr. Zingiberis, ... ℥iss.
Syr. Simplicis, ... ℥ij.
M. Sig. Take one teaspoonful four times a day.

Should the bowels remain constipated, the quantity of the senna may be increased. It acts on the liver, and exerts a decidedly beneficial effect upon the mucous membrane of the stomach and bowels.

For eczema of the scalp the best local remedy is a solution of the supercarb. soda, ʒij to the quart of water. Three or four doubles of lint or old porous cloth should be saturated with the solution, and applied morning and evening, evaporation being prevented by the application of oiled silk until the scabs are removed, and the zinc or citrine ointment should then be applied. The hair should be kept very short during the treatment, and the strictest attention should be paid to cleanliness, diet, exercise, and clothing.

In strumous ophthalmia, in addition to the constitutional treatment, local remedies are necessary, and the best collyrium to remove the excessive photophobia that always exists in such cases is a solution of the nitrate of silver, two grains to ℥j of distilled water. Its use should be abandoned as soon as possible, and a solution of sulph. aluminæ, grs. v to the ℥j of distilled water, or some other astringent substituted, because if the nitrate of silver be continued long, it stains the conjunctiva, and injures the appearance of the eye.

An excellent substitute in such cases for the preparation before given, particularly when the effect has been diminished by repetition, is the following:

℞.—Quiniæ Sulph., ... ʒj.
Syr Rhei. Arom.,
Syr. Zingiberis, āā . . . . . ℥j.
Syr. Simplicis, ... ℥ij.
M. Sig. Give one teaspoonful three times daily.

In cases in which the child is pale and somewhat emaciated, without the existence of intestinal irritation, ʒij of the precipitated carbonate of iron may be added to either of the mixtures with, in many cases, the happiest result. I prefer this preparation of iron

for children because it is equally efficacious and comparatively tasteless.

When the lymphatic ganglions, submaxillary glands, or testicles become enlarged, the iodide of potassium is preferable to any other remedy. It may be combined with laxatives and tonics if necessary. ℥iv to ℥vi of syrup should be taken by an adult three times a day in teaspoonful doses, and one-fourth the quantity to a child four years old. In such cases, whether male or female, when near or at the age of puberty, Blancard's pills will be found superior either to the iodide of potassium or to any preparation of iron separately administered. The worst case of enlargement of the ganglions of the neck that I ever treated yielded in three months to the use of these pills. Cod-liver oil is highly recommended by many able surgeons and physicians, yet I must say that in such cases it has, in my hands, failed to produce the effect claimed for it by its advocates. Few stomachs can retain it, and fewer still can digest the quantity usually administered. For children, when its protracted use is necessary, cream is preferable. I have taken it myself, but never with advantage, as it always deranged the stomach and acted as a cathartic.

Local Treatment.—This consists almost entirely in the use of such remedies as when properly applied will remove enlargements and indurations of the parts implicated. Equal quantities of the tincture of iodine and tincture of arnica applied with a camel's-hair pencil, morning and evening, will be found to be exceedingly valuable. When the skin is delicate, as in children, ʒj of the iodide of potassium with ℥j of the spts. vin. rectif. and ℥xj of water, may be applied by saturating lint with the solution, and covering it with oiled silk to prevent evaporation. In enlargement and induration of the testicle, the ungt. hydrarg. mitis will increase the action of the absorbents, and remove the difficulty more speedily than any other application that can be made. When suppuration takes place the abscess should be opened and treated as one of a different character, and should the ulcer fail to cicatrize, and a sinus remain, the cavity should be filled with equal quantities of the compound tincture of iodine and water, and this allowed to escape after remaining five minutes.

Operations for scrofulous affections should be confined to the bones, and should not be performed until the periosteum is detached and the whole of the disease removed; then the bone is speedily reproduced, and the result is in many cases really extraordinary.

Fig. 46 represents the foot and leg of a child many of you have seen, from which, three years ago, all the bones of the ankle-joint with three inches of the lower extremity of the tibia were removed.

Fig. 46.

The limb is nearly as long as the other; the motion of the joint is perfect, and with a laced boot she walks with as much ease and as rapidly as any other child of her age. Her general health is good, and it is highly probable, with proper care, that the difficulty will not return.

Fig. 47 represents the appearance of the foot and leg of a lady

about twenty-eight years old, who when operated upon weighed only seventy-five pounds, being reduced by the pain which resulted from the extensive disease of the bones of the ankle-joint, and the profuse discharge inseparable from such a condition. In this case all the bones of the ankle were removed through small lateral incisions, with toothed forceps, and about two inches of the lower extremity of the tibia and fibula with the trephine and chisel. All the dead bone being removed, she recovered rapidly, and now does not find it

Fig. 47.

necessary to use either a stick or crutch. In such cases, unless the patient is hopelessly exhausted, I never amputate a limb. Within a few months I have saved a lad in this city from mutilation by simply removing the lower extremity of the tibia. The wound healed in three months; he is now in perfect health, with simply a partial anchylosis of the joint, which still leaves the limb much more useful than a wooden substitute would be.

In operations of this character writers generally advise free incisions, but I counsel you to pursue a different course. Make an opening only large enough to admit the forceps or trephine, and you will

always be satisfied with the result. You may by judicious treatment, even where a strong predisposition exists, prevent the development of tubercles, but when they form in the lungs and become softened, the disease is incurable, although it may not prove speedily fatal. From the rapid improvement of the general health produced by cod-liver oil and other remedies, with change of climate, I have in a few cases for a time been almost induced to believe a cure possible, but every case, sooner or later, has resulted fatally. A few years ago a young man, with cavities in both lungs, and greatly emaciated, was advised to spend his summer in the Coast Range, and to live on fish and game. In a few months he returned apparently well, with the exception that the cough remained and the cavities still existed. Very soon he lost his appetite and strength, and soon fell a victim to the diarrhœa and exhausting perspiration that always exist in the last stages of this dreadful disease. By living well and sleeping in the open air consumption may be prevented but not cured. I was long acquainted with a native of New York, who had tubercles in the lungs and repeated hæmorrhages for twenty years. He was in easy circumstances, and consequently spent the summer months in his native State, and the winter either in the interior of South Carolina, Florida, or Louisiana. The frequent changes kept his general health good and arrested the progress of his disease until he was fifty-two years old. Having a beautiful farm near New York City, and his condition being exceedingly flattering, he determined to remain there during the winter. So soon as the weather became cold he was attacked with pneumonia, by which he was confined to his bed during the remainder of the winter, and he died soon after reaching Columbia, South Carolina, early the following spring. Never send a consumptive patient to a tropical climate, and never, when in an advanced stage, to any other place except to the home of a relative, guardian, or friend, unless they have the means to secure all the attention such a hopeless and helpless condition demands.

LECTURE XII.

As previously announced, I will lecture to-day upon the arteries. There are two great arterial trunks in the human body. One conveys the blood from the right side of the heart to the lungs, which is called the pulmonary artery; its final branches do not anastomose, and are intended to expose the blood to the action of the atmospheric air; when oxygenized it is returned by the pulmonary veins to the left side of the heart, and from thence is distributed by the aorta and its branches to every portion of the body. The branches of the pulmonary artery not only do not anastomose, but are also almost entirely exempt from disease. A few months since I examined a man who had an aneurism in the right side of the chest, near the nipple, and from its position I believe that one of the branches of the pulmonary artery was implicated; even if the diagnosis was correct, that case would simply present an exception. The branches of the aorta besides anastomosing freely are very liable to become diseased, consequently it is in that vessel and its ramifications that we are particularly interested. The arteries are composed of three coats; 1st. Cellular. 2d. Muscular. 3d. Serous. The external or cellular is dense, firm, resisting, and flexible. The middle, muscular or elastic coat is both extensible and resilient. It yields readily to pressure, but when that is removed it speedily recovers its original form. The internal or serous coat is more delicate than the former, and being a serous membrane it is very liable to inflammation as well as to other diseases.

All the coats being vascular are subject to disease, but when the serous or internal coat becomes inflamed, the vessel may be obliterated by the effusion and organization of coagulable lymph. The same thing may result from wounds, bruises, or pressure. If long-continued pressure be made upon an artery the serous coat will inflame, and the vessel be obliterated as already described. In that manner we sometimes succeed in curing aneurism, particularly if the pressure be made above the tumor.

When a large bloodvessel is obliterated, if a proper course of

treatment is not pursued, the parts which received blood from the vessel destroyed may mortify, as in cases of gangræna senilis, or of the application of a ligature upon the main artery of an extremity. The former may result from the deposition of calcareous matter upon the serous coat of the vessel, by which the calibre of the latter is so much diminished that the blood is excluded from parts which it should supply. When an extremity becomes gangrenous in consequence of the main artery being ligated, the only alternative left is amputation.

Fatty degeneration of the inner coats of the artery is exceedingly common on this coast. The vessels when weakened either by this or an atheromatous condition dilate readily, which accounts for the frequent occurrence of aneurism in this State. Calcareous scales on the contrary do not render the coats of the vessel less resisting, and I have never met with a case of aneurism which resulted from that cause. The obstruction interferes seriously with nutrition, but is never accompanied with dilatation. Injuries of the arteries constitute a very important part of this subject. When they are wounded, the blood escapes very rapidly, and flows either in a continuous stream or by jets, according to the size of the vessel injured. If a large artery be wounded, the blood flows in an uninterrupted stream, as I had once an opportunity to witness very unwillingly. I was amputating at the hip-joint, and the assistant who was expected to control the hæmorrhage by pressure failed, and so soon as the femoral artery was divided the blood escaped in a continuous stream, and struck the side of the room at least ten feet from the patient. I caught the vessel with the thumb and forefinger of the left hand, and arrested the hæmorrhage until spring forceps were adjusted, and a ligature applied. In the completion of the operation the arteries were ligated so soon as they were divided, which precaution was indispensable to its success. If the wounded artery be small the blood always flows by jets; the loss is much less rapid, and consequently less dangerous. In all cases, even if prepared to apply a ligature, arrest the hæmorrhage as speedily as possible by pressure. Take hold of the vessel with spring forceps and apply a ligature which corresponds in size with that of the wounded vessel. If very small a single thread of silk will be sufficient, but if it be the femoral artery the ligature should be at least four times as large.

A great variety of opinions have been entertained respecting the agents by which hæmorrhage is arrested.

Petit supposed that it resulted entirely from the coagulation of the blood, and that the formation of coagulum commenced at the wound, and gradually increased until the vessel was closed.

Morand thought that besides coagulation, there was also contraction of the mouth of the vessel, and Pouteau, that it resulted from infiltration of the surrounding tissues. Dr. Jones in 1807 proved by experiments that the process was exceedingly complicated, and did not consist simply of either coagulation, contraction, or infiltration into the surrounding tissues, but that in the first place the artery both contracts and retracts, in consequence of the elasticity of its parietes, and particularly of the inner and middle coats. The external being less contractile and more unyielding, projects beyond the former, and presents a slight obstacle to the escape of blood. Some adheres to the surface, and lessens the velocity of the current, which favors both infiltration into the surrounding cellular tissue and coagulation. The latter commences on the outside of the vessel, gradually extending to the interior until the escape of blood is arrested. The most important part of the process is yet to be performed. So soon as sufficient inflammation of the internal coat can take place, plastic lymph is effused; this becomes organized, and closes the vessel permanently. Plastic lymph is the great agent by which all bleeding vessels are closed. Without it a temporary suspension would occur, but in order that the hæmorrhage may be permanently arrested, inflammation of the serous membrane must take place, and lymph be both effused and organized.

When an artery is wounded by a cutting instrument, the hæmorrhage is always profuse and obstinate, which is not usually the case in contused and lacerated wounds. Here the loss of blood, even when vessels of considerable magnitude are divided, is sometimes so trifling as to give but little inconvenience. In such cases the external coat, being the last to yield, and being less contractile, projects beyond the internal and middle, and favors a speedy coagulation of the blood, by which the hæmorrhage is temporarily arrested; but you cannot calculate upon its permanency, as the coagulum will be detached, and what is called secondary hæmorrhage will supervene, unless plastic lymph is effused and organized.

The question now arises, what are the best means to control

hæmorrhage from a wounded vessel? The first and most simple is pressure; second, torsion; third, stypties or hæmostatics; fourth, the ligature; fifth, the actual cautery. If the wounded vessel be small, and located where pressure can be made properly, it generally obviates the necessity of resorting to other means. Should pressure fail, torsion may be resorted to, particularly if union by the first intention is desirable. It consists in taking hold of the vessel with spring forceps, and twisting it until the forceps are detached. Should that method fail, then a ligature should be applied.

Although numerous hæmostatics were formerly recommended and employed, there are only a few that are worthy of confidence. In epistaxis the hæmorrhage can generally be arrested by introducing wet lint covered with powdered alum. The sulphate of copper used in the same manner is more effectual, although more painful. The most powerful remedy of that character is Monsel's salt. When placed upon wet lint, and passed into the superior strait, and retained by plugging the nasal cavity effectually, it never fails to produce the desired effect. I have never found it necessary, in a case of this character, to use Bellocq's sound, having been able in every case to relieve the patient by less disagreeable remedies. I prefer the alum in ordinary cases, because it is much less unpleasant than the other articles specified, and has never failed to produce the desired effect.

In wounds upon the hands, feet, or any other portion of the body where pressure can be combined with a hæmostatic, I prefer the Monsel's salt, and with it, if it can be applied to the mouth of the bleeding vessel, you can control a hæmorrhage from either the radial or ulnar arteries. It is not simply an astringent, but it also coagulates the blood instantaneously, which renders it necessary before the application is made that the hæmorrhage be arrested by pressure above the wound, and all the coagulated blood removed, so that the salt may come in contact with the wounded vessel. The coagulum is larger, and occupies more space than when in the fluid state, consequently the vessel is completely closed. If Monsel's salt cannot be obtained, the muriated tincture or the solution of the perchloride of iron may be substituted, which can always be found in any drug store even in the interior of this State. The preparations of iron are superior to other hæmostatics, because they coagulate the blood in the vessel, which renders them more safe and reliable than any of the other agents of this character. I think the

discovery of Monsel's salt was one of the most useful that has been made in surgery, except chloroform and the silver suture, during the last half century. I removed the tonsils of the public administrator of this city soon after it was discovered, and in forty-eight hours found him completely exhausted from loss of blood. He had been bleeding four or five hours, and I was apprehensive that it might become necessary to ligate the carotid artery. Lint covered with Monsel's salt was applied and held in contact with the wound for five minutes, which arrested the hæmorrhage. Should the blood escape from a wound produced by removing the right tonsil a strip of wet lint, one inch wide and three inches long, should be placed upon the right forefinger, and the portion upon the extremity of the finger should be covered with Monsel's salt and then placed upon the bleeding surface, and held in contact with it for five minutes; when removed, should the hæmorrhage return, a similar application should be made and repeated if necessary. Recently I removed the tonsils of a girl about ten years old, and on the evening of the second day the wound on the left side bled so rapidly that the parents were greatly alarmed; Monsel's salt was applied without difficulty, and the bleeding vessels were closed by a single application. In both the cases mentioned the hæmorrhage did not occur until the second day, and not until the vessels became distended by the inflammation that succeeded and resulted from the operation. The hæmostatic now under consideration is inadmissible whenever we want to heal a wound by the first intention, consequently in our plastic operations it should never be employed; but in such cases, should pressure and torsion fail, the ligature should be preferred. The next and most reliable method to arrest hæmorrhage is by the ligature. You have all seen it applied in the City Hospital, and consequently it is unnecessary to describe the operation minutely. Ambrose Paré, one of the most distinguished surgeons of his day, was the first to apply a ligature, about the end of the sixteenth century. Everything, when well understood, appears simple, and you are all, no doubt, astonished that some one had not thought of it sooner. Before his day, when an artery as large as the radial or ulnar was wounded, the hæmorrhage almost always proved fatal.

Paré in applying the ligature used a large curved needle, and included within the grasp of the ligature as large a quantity as possible of the surrounding tissues.

I was compelled on one occasion, and when I was very young, to adopt that method in the following case: Mr. Stockton, who still lives in Statesville, North Carolina, was thrown from a buggy, and had a compound dislocation of the ankle-joint. His physicians being unable to agree, I was called from an adjoining State to decide upon the course that should be pursued. I found the entire tibia, except about three inches of the superior extremity, denuded, and all the bones of the ankle-joint carious. The subcutaneous cellular tissue was extensively infiltrated with serum and imperfectly organized lymph. As it was impossible to save the limb, and three or four inches of the tibia being healthy, I determined to operate so as to save the knee-joint. When the ligature was applied to the artery, it yielded as readily and made as little resistance as could be expected from an ordinary tallow candle. The bones were then removed about an inch above. The ligature was then made to include a considerable quantity of the surrounding cellular tissue, and although the coats of the artery were diseased, the hæmorrhage was thus arrested, the knee-joint saved, and the patient not only made a rapid recovery but is still in good health.

Bloomfield, in 1772, only a century ago, was the first to apply a ligature directly upon the artery without the intervention of the surrounding parts. It was drawn out with a tenaculum, the same instrument that is now used for that purpose, so as to place the ligature as far above the open mouth of the vessel as possible, which lessens the danger of secondary hæmorrhage. Ordinarily the duck-billed forceps are used, and generally they are preferable, particularly in deep narrow wounds. Yet a difficult and extensive operation should never be performed without having within reach two or three pairs of spring artery forceps. With them the hæmorrhage can be arrested until the operation is either completed or sufficiently advanced to ligate them properly.

The best material for ligatures is silk, and the size should depend upon the magnitude of the vessel. Every bleeding vessel which does not yield readily either to pressure or torsion should be ligated, in order to avoid secondary hæmorrhage, which may come on in a few hours, or even in much less than an hour after the wound has been dressed. When the artery is large, I always use a flat ligature composed of four threads of saddlers' or sewing machine silk, and apply it firmly, and I have never been troubled with secondary

hæmorrhage except in one case, and that occurred after ligating the external iliac, in consequence of the existence of a hæmorrhagic tendency, as the blood escaped not from the iliac artery, but from the vessels wounded when the peritoneum was detached from the iliac fossa. The vessels were so small that not an ounce of blood escaped during the operation, but on the third day the loss of blood was sufficiently profuse to destroy the life of a patient already exhausted by a previous hæmorrhage. Against that peculiar constitutional tendency a surgeon cannot guard, but in no other cases in which it has become necessary in my practice to ligate the large vessels have I ever been troubled with secondary hæmorrhage, satisfied that the use of two flat ligatures, and the force used in the application, which is nearly as much as I can exert, is the only reason that can be assigned for the exemption, except it be that I never employ the surgeon's knot in such cases, and always apply two ligatures, one at each end of the opening in the sheath. I confine the surgeon's knot to silk sutures used for closing external wounds. If an artery be wounded both ends should be tied; never, if it be possible to expose the vessel at the point injured, apply the ligature above. The external wound should be enlarged sufficiently to enable you to secure the vessel promptly. The same course should be pursued when a vessel has been divided without an extensive external wound. Leech-bites frequently bleed very obstinately, so much so in some cases as to prove fatal. Should the application of dry lint combined with pressure or the hæmostatics previously recommended fail, then a small pin should be passed through the lips of the wound and secured by the figure-of-8 suture. This cannot fail even when the hæmorrhagic tendency is decided. When blood escapes from the umbilicus a few days after birth, the hæmorrhage is always exceedingly obstinate and sometimes fatal. In the cases with which I have met, jaundice existed, produced by enlargement and induration of the liver. Recently, in a case which occurred in this city, the flow of blood was arrested by passing two large flexible pins through the umbilicus as near the abdomen as possible; at right angles above these a strong flat ligature was applied with sufficient force to control the circulation. It was allowed to remain six days, and until the hepatic derangement was removed by the use of the proper remedies.

Whenever an artery is accessible, no matter how small, it is always

more safe to apply a ligature. You can sleep more comfortably after performing an extensive and dangerous operation, when you know that the vessels have all been ligated, and that the wound was not dressed until reaction was fully established, and that a coagulum had formed in those too small to require a ligature. When a vein is wounded it may be the source of a troublesome hæmorrhage, although a different course of treatment is required. In such cases you should neither apply hæmostatics nor the ligature, but rely entirely on pressure; your object should be to arrest the flow of blood, and effect union by the first intention. Such wounds when properly treated are not as dangerous as many surgeons suppose. The internal jugular vein is sometimes so large as to conceal the carotid artery, and may be wounded in endeavoring to expose that vessel; this occurred in a case in which I ligated the artery before removing a tumor from the mouth. The artery not being sufficiently exposed, the external wound was enlarged with blunt scissors, and the internal jugular wounded; a small portion of clean, soft sponge was applied, and retained by the finger of an assistant until the operation was completed. A single point of the interrupted suture was then substituted, and on the tenth day the sponge, being detached by suppuration, was removed, and the patient experienced no inconvenience from the accident. The same course was pursued successfully in a case of profuse hæmorrhage from the hæmorrhoidal veins. In that case the sponge was introduced, and kept in contact with the wounded veins until it adhered firmly to the surface, and was left in that position by keeping the bowels constipated for five days, and when removed there was no return of the difficulty. I treated a case in this city in which the femoral vein was wounded, during an operation for caries of the femur, with the same result. Some years since, a butcher at the corner of Second and Stevenson Streets, wounded the external iliac vein; the case was treated successfully by Dr. Carman and myself by applying a firm compress, and securing it by a roller bandage. I have never lost a patient by venous hæmorrhage which resulted from a wound. It is easily arrested by pressure, and the wound in the vessel heals by the first intention. When secondary hæmorrhage occurs after an operation, what course should be adopted? The dressings should be removed as speedily as possible, the wound exposed, cold water applied, and pressure made if the escape of blood be sufficient in quantity to excite alarm. Some

years ago I found it necessary, in consequence of the existence of gangrene from exposure to cold, to amputate both legs below the knees. A few days after the last operation a messenger came to my office to say that the patient was bleeding to death. Being about one hundred yards distant, only a few minutes elapsed before I saw him. The blood was running in a full stream from the end of the stump. The bandages were removed as speedily as possible, and before the stump was sufficiently cleansed to enable me to see a bleeding vessel the blood ceased to flow. It appeared to ooze from the surface of the entire stump, and if it had not been exposed, and cold water applied, it would most probably have proved fatal. The wound was not dressed for three or four days, and then it presented a uniform granulating surface. Hæmorrhage of this character is frequently produced by bandaging the limb too tightly. Indeed, almost all the unfavorable symptoms, both from fractures and amputation, result from that source. If in such cases the pressure be sufficient to produce pain, and it is long-continued, inflammation with all its consequences is inevitable. This is a subject which should be well understood, for nothing is so important in surgery as the ability to arrest external hæmorrhage under any circumstances, and certainly nothing is so alarming, both to the patient and friends, yet with the necessary self-possession it is not difficult. You can by pressure check the flow of blood even from the femoral artery until a ligature can be applied, and the difficulty permanently controlled.

LECTURE XIII.

An aneurism is a sac which contains either fluid or coagulated blood, or both, and communicates with an artery. When the coats of an artery become diseased, as explained in my last lecture, aneurism may occur. It may result from either a pultaceous or atheromatous condition of the inner coats, or from fatty degeneration, in consequence of which the walls are rendered less firm and resisting, so that the vessel at that point enlarges, and an aneurismal tumor is the result. This description is applicable, as will be hereafter explained, to true aneurism. The internal and middle coats yield more readily than the external, and the magnitude the tumor may acquire will depend upon the size of the artery, the power of the heart, and the location of the tumor.

Aneurisms are divided into true and false. In true aneurism one or more of the coats of the vessel remain entire. In false they have all yielded, and the sac is formed by the surrounding tissues. Such a condition may be produced either by the rupture of a true aneurismal sac, or by an incised, punctured, or contused wound. It is, however, usually due to wounds made by small cutting instruments, which divide the coats of the artery without inflicting an external wound large enough to give rise to a fatal hæmorrhage.

True aneurism is subdivided into: 1st. Fusiform; 2d. Sacculated; 3d. Dissecting.

1. In the first the coats of the artery do not yield, but are distended and thickened. This occurs generally in the aorta, and is not unlike a varicose vein which is enlarged, thickened, and elongated. It is really a dilatation of all the coats of the artery, and may result from hypertrophy of the heart, without the previous existence of disease of the arteries.

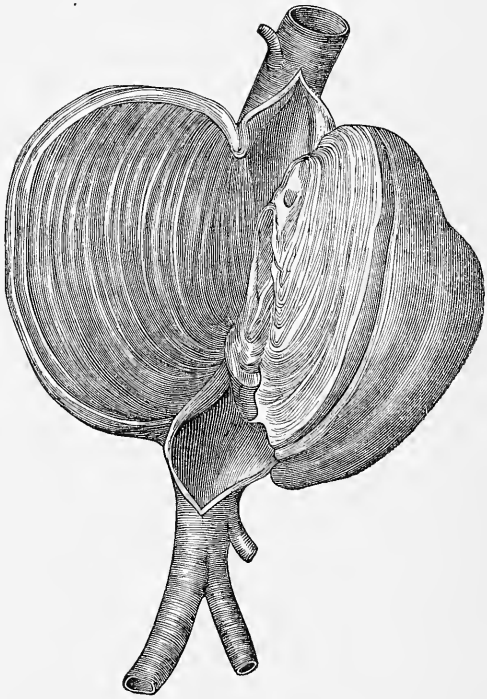
2. The most common form is the sacculated, which is the term applied to the variety in which the inner coats of the artery on one side only have yielded. If atheromatous or fatty degeneration has been confined to one side, or has progressed more rapidly upon one side than the other, the part in which it has made the greatest prog-

ress will be the first to yield, and consequently the tumor will form at that point.

3. The third variety is called the dissecting. In this form, the blood, after passing through the internal and middle coats, may meet with so much resistance from the external, that it will make its way some distance between them, thereby forming a second vessel, and finally may either pass into the artery, from four to six inches from the point at which it escaped, or find its way through the external coat and prove speedily fatal.

It is believed by pathologists that fusiform aneurism, or that resulting from simple dilatation, is confined exclusively to the arteries of the brain and the aorta. Fig. 48 illustrates a case of sacculated

Fig. 48.



aneurism, which arises entirely from the side of the vessel. The tumor is composed of strata or different layers of coagulated blood, which differ in color in proportion to the time they have occupied

their position. The external present a whitish appearance; in the middle they are reddish, but red blood is not found until you approach the centre of the tumor. I recollect that some years ago it became necessary, in consequence of pressure upon the trachea, to remove a large tumor from the neck. No pulsation could be detected, it was of long standing, and consequently its true character could not be ascertained. An incision was made through the integuments and subcutaneous cellular tissue, and the tumor exposed, but it did not present the appearance of an ordinary fibrous tumor, which was supposed to be its character. I made a very short incision through the sac and into the cavity of the tumor. At first fibrin escaped, then coagulated blood, and finally a current of arterial blood as large as the carotid, which proved that it was an aneurism in which the pulsation had entirely ceased. Dr. Wells, of Columbia, South Carolina, closed the opening in the sac with his forefinger and thumb; the external wound was then enlarged, the artery soon exposed both above and below the tumor, and suitable ligatures applied. The entire sac sloughed away in four or five days, and the patient recovered.

Fig. 49 represents a true aneurism, in which the sac has yielded to the action of the absorbents.

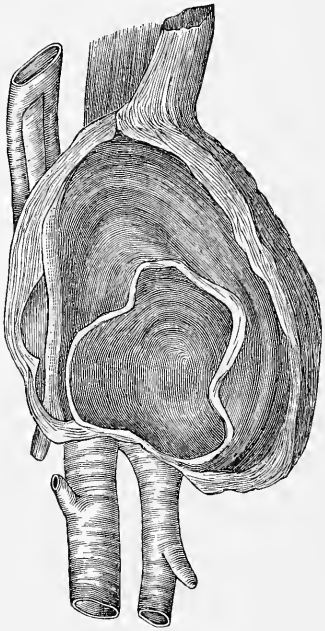
The arteries most liable to aneurism are: 1. The aorta; 2. The popliteal; 3. Femoral; 4. Axillary; 5. Carotid. When the aorta becomes greatly enlarged, the sternum, ribs, vertebræ, and even the clavicle will disappear, and indeed any bone, no matter how large or solid it may be, will yield to the pressure exerted by an enlarged arterial trunk. Sometimes these tumors acquire an extraordinary magnitude, before the external coat with the surrounding cellular tissue and integument yield. I have treated six cases within the last two years, in which the tumor was as large as a man's fist above the level of the ribs and sternum, and in one of the cases both popliteal arteries were similarly affected. He died at sea on his way to the East, where he supposed he could find relief.

Next in point of frequency is aneurism of the popliteal artery. I have ligated the femoral more frequently than any other vessel for the relief of that difficulty. Some of you have seen two aggravated cases of aneurism of the femoral artery operated upon in the County Hospital. The external iliac was ligated, and in one of the cases the tumor was so large that it was impossible to see the vessel. The en-

tire sac with the integument sloughed, and still, after a long struggle, the patient recovered.

Aneurism of the carotid artery I have seldom seen, and it occurs much less frequently there than in the axillary. The carotid artery is, however, very important in consequence of the necessity that frequently exists to ligate that vessel in order to arrest hæmorrhage from the mouth or throat, or to remove an enlarged parotid gland

Fig. 49.



or other tumors from the neck or head. Males are more liable to aneurism than females because they are required to make more violent muscular efforts. Sailors are particularly liable to popliteal aneurism; I have met with more than double as many cases of that character as of any other variety whilst I had charge of the United States Marine Hospital in this city.

False aneurism may be either primary or secondary, and either circumscribed or diffused. The first results from the wound of an artery, the second from the rupture of a true aneurismal sac.

In one case upon which I operated, of primary false aneurism, the

brachial artery was punctured by an ordinary duck-shot, and from this was developed a diffused aneurism that extended from the insertion of the biceps above that of the deltoid. The sac was opened freely, and a ligature applied both above and below the wound, and the patient made a rapid recovery.

Symptoms.—In external aneurism, whether true or false, you will always find a tumor, which is generally either oval or round and circumscribed, but it may be both extensive and diffused. Other tumors may present the same shape and consistence, and the only true diagnostic symptom is the pulsation, which is seldom absent. Yet, when the tumor is of long standing and the cavity is filled with coagulated blood, so that the calibre of the vessel is increased but little above its normal condition, the pulsation may be much less distinct than in recent or acute cases, or may disappear altogether. It generally corresponds with the pulsations of the heart, and sometimes if the ear be applied to the tumor, a bruit can be detected which may be either of a sawing or rasping character, and is called the aneurismal thrill; I repeat that it cannot always be detected.

You should be exceedingly cautious in giving an opinion in reference to the existence of aneurism of the abdominal vessels. Every day errors are committed by physicians who mistake abdominal tumors of a different character for aneurism, and even the pulsation of the abdominal aorta, which is sometimes so distressing in chronic irritation of the stomach and bowels, is often mistaken for the same difficulty. I have met recently with three cases of aneurism of the abdominal aorta, and in every case the patient was unable to remain in a horizontal position without suffering the most intense agony.

In aneurisms, both external and internal, great inconvenience must necessarily result from the pressure they exert upon the surrounding parts. When large and situated in the popliteal space, upon the upper part of the thigh, or in the axilla, a painful œdema of the extremity must necessarily exist. When located in the chest or abdomen, the functions of the thoracic and abdominal organs will be more or less disturbed. If located in the vicinity of a nerve, which is generally the case, not only excessive pain should be expected, but also a derangement of the function of the organ which it supplies. A tumor of this character should be expected to increase in size until the sac is either ruptured or the vessel is oblit-

erated by the accumulation of laminated fibrin which destroys the circulation; the fluid contents are then absorbed, and a spontaneous cure may result.

This termination is unfortunately very rare, yet, improbable as it may appear, well-authenticated cases may be found of a spontaneous cure having occurred in aneurism of the aorta. Generally the sac yields before the vessel is obliterated, and if it be internal a fatal hæmorrhage must result, but if external we may have to contend with a diffused false aneurism. When I had charge of the United States Marine Hospital of this city, two cases of that character were admitted within a few weeks. They arrived in nearly the same condition. About six weeks after leaving New York for this port, they were compelled to make violent exertions, and soon afterwards suffered excruciating pain with great enlargement of the entire foot and leg, which, with the confinement and want of care, deranged the general health so much that they appeared to be almost in a hopeless condition. In both cases the fascia of the leg was distended to its utmost limit, and the bones were both denuded to within two or three inches of the knee-joint. The only alternatives were to amputate above the knee, or ligate the femoral artery, and when the soft parts sloughed to divide the bones and save the knee-joint. The femoral artery was ligated in both cases, the soft parts sloughed to within about three inches of the knee, the bones were divided, and the knee-joint with a portion of the leg saved. In one of the cases the entire fibula was diseased, but a sufficient portion of the tibia retained its vitality to make a good stump. They both recovered with the use of the knee-joint, which is very important to a laboring man. In such cases, instead of amputating above the knee, always ligate the femoral artery, and when the soft parts slough divide the bones, and thus save as much of the leg as possible. In some cases of aneurism, particularly in young and vigorous subjects, the sac and surrounding tissues frequently inflame and even suppurate, and then if an incision is not made, and the proper means adopted to arrest the hæmorrhage, the skin will ulcerate, and a fatal termination is inevitable.

The question now arises, how should aneurism be treated in order to effect a radical cure? The treatment, as in almost all diseases, is both local and constitutional. From the latter no very decided beneficial effect can be expected except as a preparatory measure. Val-

salva recommended bloodletting, confinement to the horizontal posture, and almost absolute starvation, his patients not being allowed more than six ounces of solid food in twenty-four hours. This treatment, if ever useful, could only have an injurious effect upon the infirm, whether from disease or old age. In such cases tonics combined with iron when indicated should be administered, and every means adopted to improve the general health before resorting to the local treatment, which will be hereafter specified. When the patient is vigorous, and the tumor is either enlarging rapidly or is painful, rest, low diet, and an occasional cathartic should be prescribed; to control increased arterial action the depressant mixture, previously recommended, should be administered and continued until the pulse is reduced to its natural and healthy standard; this is greatly preferable to repeated abstractions of blood under any circumstances. I have pursued this course of treatment for months in cases of internal aneurism, with the effect probably of protracting a life of pain and anxiety, without ever having witnessed any permanent good effect, and I now only prescribe it to prepare a patient for local treatment, which is very important, and contributes greatly to the success of these remedies.

Before the time of John Hunter the treatment of aneurism consisted in opening the sac, removing the contents, and arresting the hæmorrhage by the use of the actual cautery; this generally failed, and amputation frequently became necessary. To John Hunter, who was the medical genius of his time, is due the credit of having first applied a ligature above the tumor to effect a radical cure, although but few of his patients recovered, in consequence of the imperfect manner in which the operation was performed. The ligature was not applied sufficiently tight to divide the middle coat of the artery, consequently the inflammation that resulted was not sufficient to supply the necessary deposition of plastic lymph to obliterate the vessel.

For the present improved method of treating aneurism we are indebted to Hodgson, Lawrence, Travers, Cooper, Abernethy, Post, and Mott. They applied the ligature firmly and were often successful. The ligature should be large, flat, and applied with sufficient force to divide the middle coat of the artery. Of all the ligatures which I have applied in such cases only one failed to obliterate the vessel, and that was in the case already mentioned in which there

existed a hæmorrhagic tendency, and was first applied upon the femoral near Poupart's ligament. The ligation of that vessel, in the exhausted condition of the patient from hæmorrhage, which resulted from a wound of the profunda femoris, offered the most favorable prospect of success. Secondary hæmorrhage occurred on the ninth day, when the external iliac was ligated, the condition of the patient having been greatly improved by proper treatment; but in three days he bled to death from the small vessels ruptured in detaching the peritoneum from the iliac fossa. It is not very difficult to tie an artery, but after the circulation in one is destroyed by a ligature, the parts which the vessel supplies may lose their vitality, and most assuredly will if proper treatment is not adopted. Some years since, after ligating a large artery for aneurism, I applied hot sand-bags, but from the difficulty experienced in keeping these at a proper temperature, I now envelop the limb with flannel, cover it with oiled silk, and then, until it is certain that the circulation has been re-established by the collateral branches, the extremity should be surrounded by bottles filled with warm water; when proper precautions are taken they are preferable to heated sand, bricks, or indeed any other application that can be made. They should only be employed until the natural temperature of the part has been restored, but the use of the flannel and oiled silk should be kept up until the patient has recovered sufficiently to use the limb, when a common roller bandage should be substituted. You must not suppose that when you have ligated an artery, applied flannel and oiled silk as I have recommended, and administered opium enough to relieve pain, the patient is safe, and that no other difficulty can occur by which the recovery may either be prevented or retarded. You all witnessed the ligation of the femoral artery a few days since in the hospital, for popliteal aneurism. The case was acute, compression could not be borne, the man's general health was greatly impaired, yet it was necessary to ligate the vessel. The vessel was easily exposed and tied, and the symptoms were favorable for eight or ten days; he then became restless, with a small quick pulse and the other constitutional symptoms of approaching dissolution, and upon examining the limb to ascertain the cause it was found to be mortified even above the ligature. A post-mortem examination was made, and it was ascertained that the artery was obliterated by a firm coagulum of more than an inch in length above the point to which

the ligature was applied. The internal coat of all the large arteries was diseased and softened. This was the only case in which I have ever performed an operation for aneurism in which mortification occurred. Although it is not frequent, yet when it does take place it is always unfortunate; it is more liable to occur when the patient is feeble and exhausted, either by age, disease, or hæmorrhage.

When the ligature is detached, even if properly applied, should the vessel be diseased, secondary hæmorrhage may follow, and if it does it is almost always fatal. In such cases, when practicable, it is always better to amputate the limb than to apply a ligature above, because gangrene often follows the application of a second ligature, and the patient may survive the loss of an extremity. You have also had an opportunity of watching the progress of the suppuration and sloughing of an aneurismal sac of enormous dimensions, which followed the ligation of the internal iliac artery. Five or six days after the operation was performed the man complained of pain in the tumor, which without any pulsation increased in size steadily until the fifteenth day, when I observed that the skin was disposed to slough. A free incision was then made, and two or three quarts of dark offensive coagulated blood mixed with unhealthy purulent matter escaped. I removed with my hands all that could be conveniently detached; the sac was kept filled with a solution of the chlorate of potassium, ʒv to the quart of water; the same solution was applied externally, and evaporation prevented by oiled silk. Twelve ounces of good sherry wine with twelve grains of sulph. quiniæ, and as much nutritious food as he could digest, were given every twenty-four hours, and, gentlemen, I need not say to you that he made a miraculous recovery. He is now well, and beyond a contingency. The removal of the contents of the sac was not followed by much hæmorrhage, which under the circumstances must have proved fatal in consequence of the exhausted condition of the patient. When it is impossible to apply a ligature between the centre of circulation and the tumor, or on its proximal side, then Brasdor's method may be substituted with in many cases a fair prospect of success. He applied the ligature beyond or upon the distal side of the tumor. The object of this operation is the same as that of the Hunterian. It either arrests or lessens the flow of blood through the tumor, and favors the deposition of laminated fibrin by which the artery is both filled and obliterated. I have never performed this operation but once, and

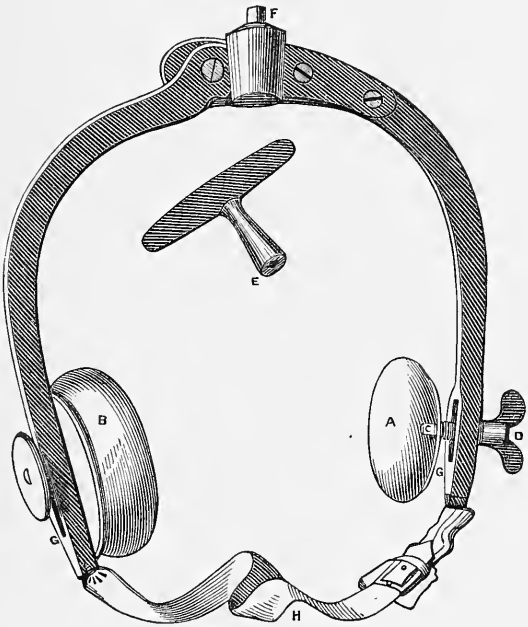
then with the most satisfactory result. The patient had disease of the heart as well as aneurism of the axillary artery; the existence of the former rendered it improper to ligate the subclavian, and the sac being very thin and inflamed, I determined to give him the chance which Brasdor's operation afforded. The brachial artery was ligated about two inches below the sac; the pulsation in the tumor gradually diminished, and by the fifth day ceased entirely. When I lost sight of him three or four weeks after the operation, the tumor was reduced to half its original size, was firm and had ceased to pulsate. This case was published in the *Pacific Medical Journal*, with the necessary details to substantiate the correctness of the statement made above.

Sometimes in a few days after the application of a ligature, when pulsation has ceased entirely, it returns, and may continue for a short period, and then disappear. This is considered much more favorable than for it to return in a month or six weeks after the operation. It then depends on the collateral branches communicating with the tumor, and if it should not disappear it can be removed by rest, and the application of a bandage. I have performed more operations for aneurism than any surgeon in America, yet I have never after the ligature was tightened, except by Brasdor's method, been able to detect the slightest pulsation.

Treatment.—Compression, when the heart is diseased or the aneurismal tumor has increased rapidly, and particularly when the circumstances of the patient will enable him to obtain the necessary attention, should be tried before the application of a ligature is recommended. Compression has been applied directly upon the tumor, and sometimes a favorable result has been obtained. It is much better, however, to make the pressure above, and the best instruments are Carté's or Signoroni's horseshoe tourniquet (Fig. 50). As this plan is only applicable to aneurism of the arteries of the lower extremities, and particularly of the popliteal, much depends upon the manner in which compression is made, and more upon the attention given to the minute details in the treatment of a case than upon the method adopted. After the limb has been shaved, powdered, and bandaged, a tourniquet should be applied, both at the groin and lower down upon the thigh, so that when the pressure becomes painful at one point the instrument can be relaxed, and sufficient pressure made with the other to retard but not to arrest the circula-

tion entirely. It should diminish the volume, and retard the velocity of the blood so much as to favor the deposition of laminated fibrin, by which the vessel may be ultimately obliterated, and a radical cure effected. Sometimes under this method the pulsation in the tumor will cease in a few days, but in other cases it becomes necessary to continue the treatment at least three months before it entirely disappears. Under all circumstances the pressure should be

Fig. 50.



continued at least forty-eight hours after the circulation in the vessel has entirely ceased, in order to prevent a recurrence of the difficulty. As compression is usually less dangerous than the application of a ligature, and since every patient with popliteal aneurism requires preparatory treatment, I think the method by compression should be tried, and should that fail a ligature may be applied, with as good a prospect of success as if the patient had not been subjected to any other method of treatment. Fergusson has proposed to treat some cases of aneurism by what he calls manipulation, which consists in making pressure upon the tumor in such a manner as to displace a

portion of the coagulum, and thereby obstruct the distal extremity of the vessel. A rupture of the sac is the only danger to be apprehended from such treatment. In hopeless cases, or those in which neither compression nor the ligature are admissible, this method might be employed. Petrequin and Burci have both recommended and practiced galvano-puncture, which consists in passing two acupuncture needles into the sac in opposite directions, but so as to remain in contact, and connected with a galvanic battery of moderate power, the action of which is supposed to favor coagulation, and ultimately to produce the effect both of compression and the ligature. The result has not been sufficiently satisfactory to encourage others to adopt the treatment, since the inflammation which it produces has been in some cases so violent as to give rise to sloughing and fatal hæmorrhage. The solution of the perchloride of iron has been injected into the sac, for the purpose of coagulating the contents and obliterating the vessel. It is too dangerous and uncertain a remedy to be employed. I have treated some nævi in that manner successfully, but in every case the entire tumor sloughed, which would be exceedingly dangerous in a case of aneurism.

Before closing this lecture I beg leave to direct your attention to dilatation of the veins. They become enlarged, elongated, and thickened. The spermatic veins and those of the lower extremities are most liable to dilatation, yet it may occur upon almost any portion of the body.

The spermatic vein of the left testicle is more frequently enlarged than that of the right, because it is longer, enters the renal at right angles, and consequently is exposed to the pressure exerted by a large column of blood, and being destitute of valves it sometimes becomes so enormously distended, that the function of the organ is impaired. Spermatorrhœa almost always accompanies this difficulty, and unless the cause is removed cannot be cured.

You should always operate in such cases. Pressure is sufficient to obliterate the vein. The constituents of the cord, and particularly the spermatic duct, should be separated from the vein, and when this is isolated two large pins should be passed behind it, the first above and near the superior extremity of the testicle, and another about an inch above. A figure-of-8 ligature should then be applied, the extremities of the pins removed, and the patient required to remain in bed from five to seven days, according to the degree of inflam-

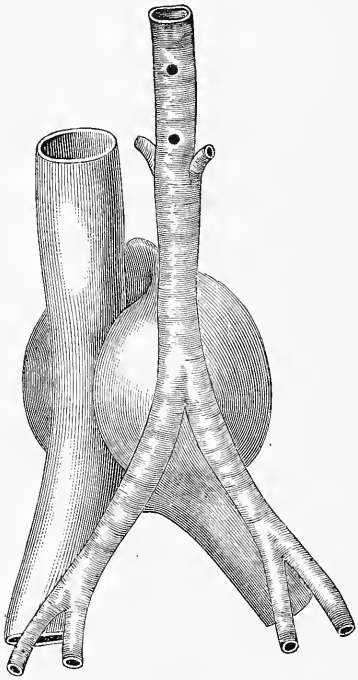
mation which may ensue. When considerable it may be necessary to remove the pins as early as the fifth day, or they sometimes may be allowed to remain seven or eight when but little inconvenience results from their presence.

I can recommend this operation as being entirely safe, and it rarely fails, either in varicocele or varicose enlargement of the veins of the leg, from which the most troublesome ulcers result. The vein should be raised with the finger and thumb of the left hand, the pin passed under the vein, and the ligature adjusted so as to check the circulation, but not sufficiently tight to produce ulceration of the skin. The pins should be inserted at intervals of three or four inches; if blood follows the introduction, they should be removed, for should they wound a vein and be allowed to remain, phlebitis would certainly follow.

LECTURE XIV.

GENTLEMEN: The hour expired before all the varieties of aneurism were considered; that which was omitted is called varicose. It is not very common, although it was described by John Hunter as early as 1756, and it reminds me of a remark I made to the class

FIG. 51.



in my lecture on minor surgery, in reference to venesection, that you should never open a vein which lies directly over an artery, for the lancet may pass through the vein, and wound the deeper-seated vessel, and the blood, after the surrounding cellular tissue becomes distended, will flow from the artery directly into the vein, which will

become gradually distended, thus explaining the origin of the name varicose. The extremity below the seat of the injury becomes congested and swollen, so that it is necessary to apply a bandage, until the artery can be ligated both above and below the wound, provided this be practicable; if not, a ligature should be applied above and pressure made over the tumor, and continued until the pulsation ceases and the enlargement is greatly diminished.

Having described both the varieties and treatment of aneurism, it is now necessary to give the various operations which you may be required to perform in order to effect a radical cure. The femoral artery, after passing about one-third the distance from Poupart's ligament to the knee, occupies the triangular space formed by the sartorius and quadriceps adductor muscles. By flexing the knee, and turning the thigh outwards, the muscles are relaxed, and the space rendered very distinct, except when it is filled and obscured by an excess of adipose tissue. The artery may be tied either above or below the sartorius, and but little difficulty will be experienced in securing it in either position (Fig. 52). An incision three or four inches long should be made, either with a scalpel or bistoury, through the skin, cellular tissue, and fascia, and then the vessel can be exposed by a director or the handle of a scalpel, without either difficulty or danger, as was demonstrated in the operation I performed yesterday, before the class, for popliteal aneurism. The sheath of the vessel was then opened with blunt-pointed scissors, and the aneurism-needle passed under the artery. When no doubt existed respecting the part exposed, and that neither the vein nor nerve was included in the grasp of the ligature, the needle was removed, and the ligature tightened with a simple square knot, which divides the coats of the vessel far more effectually and certainly than would have been possible if the surgeon's knot had been substituted. The ligature should be at least twelve inches long, and should be placed and retained in the lower extremity of the wound, which will prevent union by the first intention, and remove the necessity of interposing lint between the edges. The upper portion of the wound should then be united by two or three points of the interrupted silver suture. The water-dressing should then be applied, and renewed two or three times in twenty-four hours, or more frequently should the purulent discharge be profuse. That patient may die from purulent absorption, secondary hæmorrhage, ulceration, or mortification of either the sac or the

entire extremity, consequently all the means recommended should be employed to prevent the casualties above enumerated. The entire extremity, as you observed, was wrapped in flannel, and covered with oiled silk; half a grain of sulphate of morphia was then administered to relieve pain. The limb was placed upon the fibular side, and slightly flexed. The ligature usually remains on the vessel about seventeen days, although sometimes longer, and may require, as recommended by Professor Dudley, a large bullet to be attached to its outer extremity, which by its weight in a few days will enable you to remove it without difficulty. I have never found it necessary

Fig. 52.

to resort to this method, having always succeeded by moderate traction in removing it before the wound cicatrized. Should the opening in the sheath of the vessels be half an inch in length, then two ligatures should be applied, one at each extremity. I have always adopted that course and have had no reason to complain of the result.

The anterior tibial artery sometimes requires a ligature, and particularly in false aneurism. It may be ligated at any point, from the knee to the instep. Until the vessel comes within four inches of the

ankle-joint it is found upon the interosseous membrane, and between the tibialis anticus and extensor communis, and below that point, between the extensor pollicis longus and tibialis anticus; for two-thirds of its course it is deepseated, and in consequence of the density of the fascia it is exposed with great difficulty. The artery is accompanied by two veins, which should be avoided; the nerve, from its position, is not likely to be included in the ligature. A tourniquet should always be applied to the thigh; an incision is made three inches long and about three-quarters of an inch from the edge of the tibia; the fascia is divided, and the intermuscular space should be followed until the artery is exposed. Should the vessel be wounded, the wound should be enlarged and the fascia divided transversely, so as to expose the part more readily than would be possible unless that precaution were taken. Upon the instep the artery is so superficial, that no difficulty will be experienced either in exposing the vessel or applying a ligature. The wound should be closed as previously directed, and the same course pursued both in the local and constitutional treatment. This was the first operation I ever performed; it was done at night, by torchlight, upon a man who had wounded the anterior tibial artery the day previous. The wound was enlarged, the fascia and muscles were divided transversely, and when the vessel was exposed, it was raised with a bent probe, and a ligature applied both above and below the wound. Being very young, and consequently inexperienced, with a poor light and few instruments, I found it exceedingly difficult. Should such a case be met with now, I would fill the wound with lint, apply a bandage sufficiently tight to arrest the hæmorrhage, and defer the operation until the following day. It sometimes becomes necessary to ligate this vessel to arrest the hæmorrhage from a wound of the foot, or to check the growth of a vascular tumor which is supplied by its branches.

Posterior Tibial.—This vessel should be ligated under the circumstances already mentioned, and if it be possible to select the location, it can be found at the centre of a line extending from the malleolus internus to the insertion of the tendo Achillis. It can generally be both seen and felt at that point very distinctly, and to expose the vessel it is only necessary to divide the skin and fascia. It is accompanied by two veins, and the posterior tibial nerve is located between the artery and the os calcis. An incision two inches long will enable

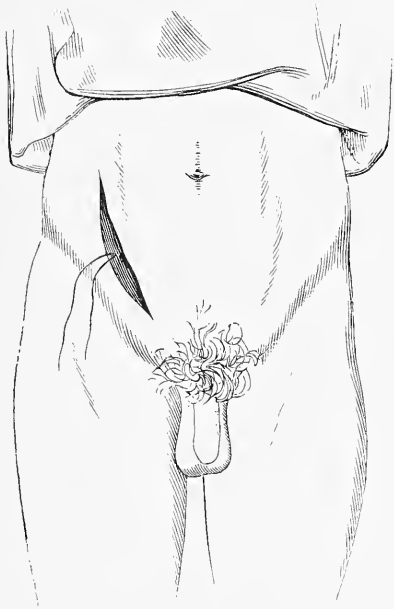
you to expose the vessel and apply a ligature. Four inches above the ankle the incision should be three inches in length, and half an inch posterior to the margin of the tibia; the vessel rests upon the flexor communis and tibialis posticus muscles, as below it is accompanied by two veins, and the nerve lies between it and the fibula. The posterior tibial, two inches higher up, being covered by the soleus muscle, it then becomes exceedingly difficult, except to the experienced surgeon, to expose it at that point, consequently I would advise you to follow Fergusson's advice, and ligate the femoral, as it would be both less difficult and less dangerous. Both these vessels may be easily exposed on the dead subject when well injected, but experience has convinced me that it is much less difficult to describe than to perform such an operation upon the superior portion of the leg. In such operations I have found it very convenient, when you ascertain the position of the vessel, to draw a line directly over it, either with a pen or pencil, the length you desire to make the incision; then by the aid of an assistant the skin should be raised, and the line followed by a scalpel, and less difficulty will be experienced in completing the operation.

In aneurism either of the popliteal or lower portion of the femoral artery, the latter should be ligated at the point previously indicated, but when the tumor is located so high upon the vessel that the ligature cannot be applied at least an inch and a half below the origin of the profunda femoris, then the external iliac should be preferred. Almost every member of this class has enjoyed the rare privilege of seeing this operation performed successfully in two very unpromising cases. In one, besides an enormous aneurismal tumor, there was, on the same side, a large incarcerated hernia, which rendered the operation more difficult, and in the other case the sac was not only immense, but projected above Poupart's ligament, and rendered the abdominal parietes so tense that the vessel could not be seen, although the incision was unusually large. Abernethy was the first to perform this operation in 1786, and although he was unsuccessful, it was repeated in 1806 with a better result.

When you have determined to perform this operation, the patient should be kept in bed for a few days; his bowels should be relieved by the exhibition every night of ten grains of the extract of white walnut, and only a small quantity of simple food allowed. The best position during the operation is upon the back, with the head

comfortably elevated. The incision should commence half an inch above Poupart's ligament, and in the centre of the space between the anterior superior spinous process of the ilium and the pubis, and extend upwards and outwards about an inch from the iliac process already mentioned, and four inches long. The first incision should

Fig. 53.



divide the skin and subcutaneous cellular tissue, and after the fibres of the external oblique have been divided, you should proceed cautiously, for it is important not to wound the peritoneum, although cases are on record in which it was injured without a serious result. The fibres of the internal oblique and transversalis muscles should be raised by a grooved director slightly curved, and divided with a bistoury; the peritoneum should then be detached from the iliac fossa with the fingers, until the pulsation of the artery can be felt. It is large, and the pulsation is so strong that it cannot be mistaken for anything else in that vicinity. The vein is on the inner side of the artery, and cannot be injured. The sheath of the vessel should not be divided with the knife, and I attribute my success to that fact. The aneurismal needle should be passed from within outward, and

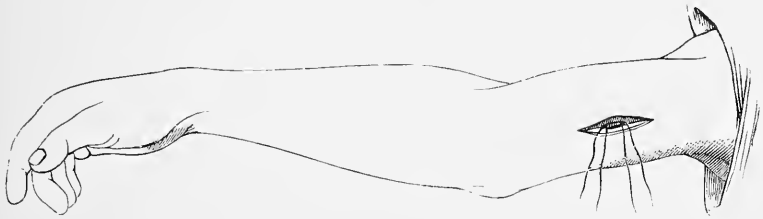
when you ascertain that the artery is upon the needle it should be disengaged, and a simple knot employed to obliterate the vessel. The ligature should occupy the inferior portion of the wound, and the upper two-thirds be closed by the interrupted silver suture. The extremity should then be treated as directed after operations upon the femoral artery. I repeat, an effort should not be made to open the sheath of the vessel, because it is always unnecessary and sometimes impracticable. In both the operations which you witnessed at the hospital it was impossible to expose the vessel, and in such cases, if you believed it to be important, nothing but disappointment could result from the effort.

It sometimes becomes necessary to ligate the internal iliac, in consequence of the existence either of an aneurism or a wound of one or more of its branches, it being generally impossible to expose and ligate the bleeding vessel. Crampton and Syme both performed this operation, but without success, and the honor of ligating the internal iliac successfully was reserved for Professor Mott. The only difference between this operation and the one just described, is in the incision, five or six inches being required to expose the vessel and apply a ligature without difficulty. The peritoneum, in consequence of the extent of the incision, is more exposed, and the liability to inflammation increased. Yet the consequences, resulting from the arrest of circulation in the internal, are much less serious than in the external iliac artery. The local and constitutional treatment do not differ. The pain should be relieved, and the fever controlled as already specified.

Aneurism of the arteries of the superior extremity seldom occurs below the axilla, except the traumatic variety, and then, as I have already advised, both extremities should be tied, provided it be possible to determine what vessel is wounded. Some years ago I applied a ligature upon the brachial artery to arrest the hæmorrhage from a punctured wound below the elbow-joint. A small sword-cane had been passed in front of the bones through the arm, which wounded a vessel of sufficient magnitude to give rise to a fatal hæmorrhage if not controlled. It being impossible to decide which vessel was wounded, and dangerous to make extensive incisions in that vicinity, as they might, should the nerves be cut, paralyze the extremity, and the patient not being able to lose more blood, he was placed on a sofa in my office and the brachial artery ligated. You

will find as much difficulty in placing a ligature upon this vessel as upon either the femoral or external iliac. The vein generally lies over it, and the median nerve on the ulnar side. The incision should be two inches long and upon the inner edge of the biceps muscle.

Fig. 54.



The artery is superficial and easily exposed, but still great care is required to avoid both the vein and nerve. Should the former be wounded nothing serious might result, yet should unpleasant symptoms arise it is very gratifying to know that the operation was properly performed. I have tied this artery repeatedly, and on one occasion the nerve was directly over the vessel, and was much more troublesome than the vein.

When the radial or ulnar artery is wounded near the wrist, and the hæmorrhage cannot be controlled by pressure, then the wound should be enlarged and the vessel secured as directed under such circumstances.

In wounds of the hand, particularly if the hæmorrhage is from the palmar arch, and cannot be readily controlled by pressure, then both the radial and ulnar arteries should be tied near the wrist. Three years ago a young man came to San Francisco from the vicinity of Marysville, with a false aneurism near the lower portion of the axilla, produced by an accidental knife-wound. The tumor was about the size of a man's fist, pulsated strongly, and occupied a dangerous location. An operation was the only alternative. The circulation in the vessel being arrested by Dr. Fourgeaud, the sac was opened and the necessary ligatures applied. The opening in the vessel was small, which in that location was just as dangerous as if it had been more extensively wounded. In such cases spring artery forceps should always be at hand, so that should compression fail the hæmorrhage can be arrested until a ligature is

applied. The incision should be free, so as to prevent any difficulty being experienced in exposing the wound.

The first operation for aneurism of the axillary artery was performed by Pelletier in 1786. He dissected up the clavicular origin of the pectoralis major muscle. Keate performed the same operation in 1800, and Chamberlain in 1815, in every case without success. Besides being improper in a great majority of cases, it is both exceedingly difficult and dangerous. Profuse hæmorrhage should be expected from the branches of the thoracica humeralis. The subclavian vein lies over the artery, and would be endangered by the operation, besides which, one of the numerous nerves which form the axillary plexus might be mistaken for the artery. It is, therefore,

Fig. 55.

much safer and easier in such cases to apply a ligature upon the subclavian above the clavicle, and after it has passed behind the scalenus anticus muscle. At that point it is separated from the vein. The vessel is more healthy than in the vicinity of the tumor, will bear a ligature better, and will resist the force of a large column of blood with much more certainty.

Ramsden ligated the subclavian in 1808, and established the practicability of the procedure, but the honor always connected with

success was reserved for Prof. Post, of New York, in 1817. The patient should be placed upon the back, with the head lower than the body, so as to expose and render tense the parts to be divided. The first incision should be made near and upon the upper side of the clavicle, and should extend from the margin of the insertion of the sterno-cleido-mastoideus muscle to that of the trapezius, which is usually about three inches. Another incision perpendicular to the first, and of about the same length, should extend from the centre of this parallel with the edge of the sterno-cleido-mastoideus. The flaps thus made should be dissected and thrown back. The omo-hyoid muscle should then be divided, and the scalenus anticus exposed, which is traced to its insertion into the first rib; on the outside and near the muscle, you will find the subclavian artery. In ligating either this or any other artery you should be guided by the pulsation, and that will protect you from the error sometimes committed of mistaking a nerve for an artery. It is useless to say anything more about the instruments used, the size of the ligature, and the subsequent treatment, as you are all familiar with everything of that character.

Aneurism of the carotid artery occurs occasionally sufficiently high upon the neck to require a ligature. You will, however, find it more frequently necessary to ligate this vessel to arrest hæmorrhage from the mouth, or to enable you to remove either the parotid gland or tumors from the neck or throat, than for aneurism. I have ligated both the common and external carotids frequently, and in every case successfully.

Paralysis of one side followed a ligation of the common carotid, in this city, which was performed to enable me to remove a large malignant tumor from the upper part of the neck and face. It continued for several months, and until the patient died of cancer of the stomach. Sir Astley Cooper was the first to perform this operation successfully, in 1808, and since that time it has been performed very frequently and successfully. The patient should be placed upon the back, with head low and turned towards the opposite side, and if the operation is performed either to remove a tumor or to arrest hæmorrhage, the artery should be ligated about half-way between the ear and clavicle. An incision should be made two inches and a half in length, near the inner edge of the sterno-cleido-mastoideus muscle. At that point the vessel is covered only by the skin, platysma

myoides, and fascia, and is easily exposed by drawing the muscle backwards, and lacerating the cellular tissue, either with a director, or with the handle of a scalpel. The sheath of the vessels should then be opened on the inner side, to avoid the vein, which partially conceals the artery, as well as the descendens nerve, which lies upon the centre of the sheath. The convexity of the needle should be turned towards the vein. If the sheath be opened, and the needle properly directed, the par vagum is perfectly safe, being posterior to the artery. Lower upon the neck the carotid is covered by the sterno-mastoid and sterno-thyroid muscles; the omo-hyoid will be exposed where it crosses the vessels, and generally requires the attention of an assistant, who should be directed to draw it downwards. The same care should be observed, both in opening the sheath and applying the ligature, as previously advised, and in this location it is exceedingly important, not only to place the ligature in the most dependent portion of the wound, but also to introduce a sufficient quantity of wet lint to allow the secretions to escape readily, both before and after suppuration is established.

Cases occasionally occur in which it is considered both right and proper to ligate the arteria innominata, although until recently it has never been performed successfully. Dr. Smyth, of New Orleans, during the late war ligated both the vertebral and the innominate successfully, and consequently deserves the credit of having accomplished what all his predecessors and contemporaries considered impossible. Dr. Mott ligated this vessel for the first time in 1818. His patient died on the twenty-seventh day, of hæmorrhage. Graefe's patient lived two months, and shared the same fate. A few years since, Dr. Cooper, of this city, ligated this vessel with the same result. This operation is not difficult to perform, but the result has been anything but satisfactory, yet under favorable circumstances, with the prestige of one successful case, it may be justifiable. Make two incisions three inches in length, the first directly upwards on the inner edge of the sterno-cleido-mastoideus muscle, and the second from the same point, above the clavicle, so as to divide the sterno-mastoid, sterno-hyoid, and sterno-thyroid muscles, and when the flap is turned up the sheath of the common carotid will be visible. This should be opened, and the artery followed downwards until the innominate is exposed. The convexity of the needle should be turned towards the sternum, to avoid the vein and pleura. Since

Dr. Smyth found it necessary to the success of the operation to ligate the vertebral, I think both vessels should be secured at the same time.

You may find it necessary to ligate the temporal artery for aneurism produced by arteriotomy. In such cases a division of the artery, and the application of a compress and bandage, will control any difficulty of that character. Should that fail, the skin should be divided transversely across the vessel, and a ligature passed under the artery with a curved needle, which, when tightened, will arrest the circulation in the vessel. I have but once found it necessary to ligate this vessel, having usually divided it transversely with a scalpel, and then with a compress and bandage I experienced no difficulty in controlling the hæmorrhage.

The next lecture will be upon hernia.

LECTURE XV.

GENTLEMEN: The only variety of tumor that remains to be described is hernia, to which I propose to devote this lecture. The protrusion of any portion of the contents of a cavity through the parietes, the integument remaining entire, is called a hernia. Formerly it received the name of rupture, because it was supposed that a laceration was necessary to enable the viscera to escape. In most cases the protrusion takes place through the natural openings,—those intended for the escape of the testicles, the umbilical cord, and the femoral vessels. The parietes of the abdomen are composed of the skin, cellular tissue, superficial fascia, the external and internal oblique, transversales recti, and pyramidales muscles, as well as the fascia transversalis and peritoneum. The muscles of the abdomen extend from the thorax, and unite at and form Poupart's ligament, which is large, dense, and strong, and extends from the superior anterior spinous process of the ilium obliquely downwards to the pubis. It is of no consequence whether we say that the ligament is formed by the union of these tendons, or serves only as a point of attachment, and protects the femoral vessels, the artery, vein, and nerve when passing from the abdomen to the thigh. Another very important part in connection with this subject is the epigastric artery; it arises from the external iliac, runs upwards between the abdominal rings, and constitutes from its position one of the dangers in operations for hernia. It is located between the fascia transversalis and peritoneum, and could not be ligated, if wounded, without endangering the life of the patient. The abdominal rings were mentioned; they are called internal and external, and the canal which connects them the inguinal. The internal ring, which is ordinarily closed by cellular substance, can be found midway between the spinous process of the ilium and the pubis, and about an inch above Poupart's ligament. It is formed by the internal oblique and transversalis muscles, and the testicle in its descent carries with it some muscular fibres, which constitute the cremaster muscle. After passing

through the internal ring, it traverses the inguinal canal, which is about two inches and a half in length; the floor or posterior surface of it is formed by the conjoined tendons of the internal oblique and transversalis muscles, and the canal is completed by that of the external oblique. The external ring is a mere slit in the tendon of the last-named muscle, is about an inch and a quarter in length, and is covered only by the skin, cellular tissue, and superficial fascia. After the testicle passes through this it soon reaches the scrotum. In hernia, neither the fascia transversalis nor the peritoneum is ruptured, being only carried down in front of and covering the protruding part. The descent of the testicle usually occurs about a month before the birth of the child, and should the internal ring and inguinal canal not be closed, a portion of the abdominal contents may descend with it to the scrotum, and form what is called congenital hernia, the existence and character of which was first demonstrated in the dissecting-room by Dr. William Hunter. The contents of a hernial tumor may be either peritoneum, intestine, or omentum, or both of the last mentioned. When the intestine protrudes it is called enterocele, when the omentum escapes epiplocele, and enteroepiplocele when the sac contains both omentum and intestine. The size varies as in peritoneal hernia, from that of a cherry to a tumor as large as a man's head, and may contain only a portion of the peritoneum, or half of the intestinal canal.

Causes.—These are divided into predisposing and exciting. In some cases there exists an hereditary predisposition to hernia, as it frequently occurs in several members of the same family, and undoubtedly depends on a want of constitutional vigor. It frequently occurs in old age, and in chronic diseases accompanied by emaciation, debility, and consequently relaxation of the tissues generally.

The exciting causes are violent muscular exertions, such as lifting heavy weights, jumping, and wrestling. Sometimes it is produced by a violent and protracted cough, and it often appears in children during the existence of hooping-cough or bronchitis.

Inguinal hernia either follows the direction of the spermatic cord, or passes directly through the external ring. The former is called inguinal, and the latter ventro-inguinal. In such cases when the tumor remains in the groin it is called bubonocele, and when it descends lower, either scrotal or pudendal, according to the sex of the patient. When a decided predisposition exists, it occurs more fre-

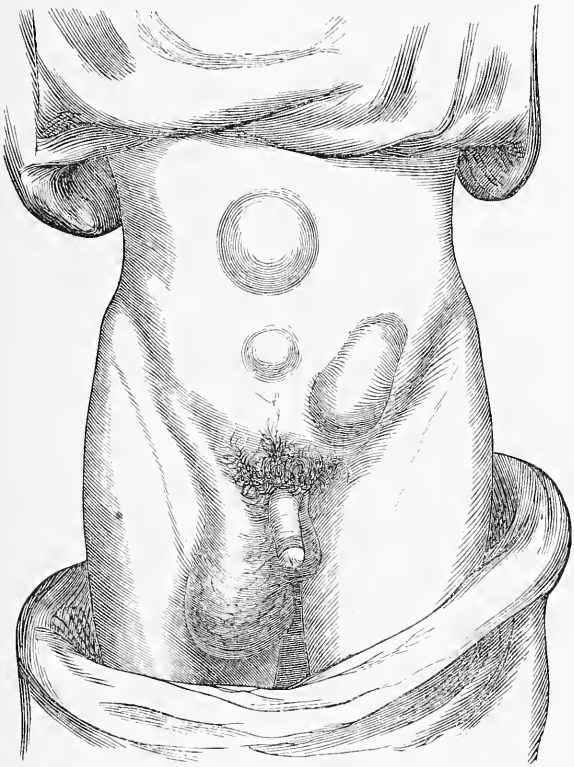
quently on the right than the left side, which may result from the muscles on that side being more powerful than those on the left.

Hernia is said to be reducible, when the contents of the sac can be returned into the abdominal cavity without an operation, and incarcerated when they cannot be replaced, and yet the intestine continues to perform its function, although it occupies an unnatural position. The patient operated upon for aneurism of the femoral artery, had suffered from this difficulty for six years, although he enjoyed good general health. A hernia is strangulated when there is sufficient pressure made upon the protruding part to destroy its function; or in other words, when the contents of the intestinal canal cannot pass through the portion which is contained in the sac and forms the tumor, it is strangulated. In every variety of hernia, if the pressure be sufficient to produce inflammation, lymph will soon be effused, and when organized the parts cannot be returned, as in incarcerated hernia; but when the pressure is sufficient to arrest the circulation in the vessel by which the protruding part is supplied, then without proper treatment mortification must result. Strangulation may be produced either by the rigidity of the opening, or by induration of the neck of the sac, particularly when an additional portion of either omentum or intestine has escaped. As already stated, the contents of a hernial sac may be either peritoneum, intestine, or omentum. In inguinal hernia a portion of the ileum is sometimes found alone, but more frequently it is united with more or less omentum in proportion to the size of the tumor. Cases, however, occur in which the cæcum, colon, and indeed almost the entire alimentary canal escapes, and may even pass into the scrotum. This occurrence is more frequent in double hernia when neglected.

Symptoms.—The symptoms of reducible hernia are, 1st, A tumor upon the upper part of the thigh at the groin, the umbilicus, or indeed upon any portion of the abdomen, which is elastic, colorless, without pulsation, and which may be returned into the cavity either by pressure or position, or both combined. When the patient coughs, there is a decided downward impulse felt through a hernial tumor, not in any other. Generally but little difficulty will be experienced in forming a diagnosis, except when hernia is complicated with hydrocele, which is not uncommon, particularly in congenital cases. Several members of this class were present when the exploring needle was used for the purpose of determining the character of such

a case. The boy was about seven years of age, and had suffered half that time from an enlargement of the scrotum. After the use of the exploring needle a puncture was made with a lancet, and after the escape of the serum, a portion of omentum protruded, so as to render it difficult to close the wound. I took hold of it with the forceps, and finding but little resistance I removed a portion, an inch wide,

Fig. 56.



and nearly a foot in length, which left the sac empty; the wound was then carefully closed, and the patient placed on his back with the head and knees both elevated; he was kept in that position for three or four days, and on the seventh after the operation he returned to the country, without having suffered the slightest inconvenience from anything except the confinement. The boy is now in good health, and cured of both hydrocele and hernia.

Strangulated hernia is a very serious difficulty, and one that should

be well understood, as no time is allowed for preparation. The patient usually complains of a distressing pain in the umbilical region, which is accompanied with constipation and either sickness of the stomach or vomiting. The constitutional symptoms are of a still more serious character. The pulse is small and frequent, the extremities are cold, the face pale, and the features shrunken, with an expression of the most intense anxiety, accompanied with extreme restlessness. Whenever you find a patient in that condition, either male or female, if any swelling has either existed for some time or has recently appeared, where you would expect to find a tumor of that character, you should act promptly, because death almost always results when a strangulated hernia is mistaken for some other difficulty.

Constipation does not always depend upon the intestinal canal being obstructed, as the same difficulty results from strangulation of the omentum, and is no doubt produced by the inverted action which is inseparable from pressure upon either the intestines or the omentum. When a case of this character has not been properly treated, inflammation takes place, which may be either confined to the hernial sac or may extend to the peritoneum, and may prove speedily fatal. When local, after a greater or less period, according to the amount of pressure and the constitutional vigor of the patient, the integument inflames, and when either the skin ulcerates or an incision is made, the intestine will be found mortified, with an opening which is called an artificial anus.

Before the discovery of chloroform, I operated frequently for strangulated hernia, but during the last thirteen years I have only operated upon two cases, and that might have been avoided if the patients had received early and proper attention.

Treatment.—Having described the different varieties of hernia I will now give you the treatment which they require. In the congenital, and when reducible, at the age of three or four months, which is as soon as the skin will bear the pressure of a truss, one should be applied, no matter how simple, if it only prevents the descent of the hernia, and it should be continued for several months after the tumor has disappeared, in order to prevent a recurrence. It is sometimes necessary for a child to wear a truss for two or three years before a radical cure is effected.

In reducible hernia in the adult, if Chase's truss is applied, prop-

erly adjusted, and constantly worn, particularly if the patient be young and vigorous, you can calculate with almost a certainty on effecting a cure. It consists of a block of wood attached to a spring with a flexible neck, so that it can be bent to suit any case either of inguinal or femoral hernia. Should ulceration of the skin be threatened by the pressure of the block, six or eight folds of new silk, larger than the block, should be placed between it and the skin; by which arrangement the effect both of the pressure and friction is removed. The internal layer of the compress adheres to the skin, the external to the block, and the remainder not being stitched together glide readily over each other, whilst those in contact both with the skin and truss remain stationary. This truss should be worn for at least two years, and should that fail then you may perform the operation which was so popular a few years ago, for the radical cure of reducible hernia, which consists in invaginating the scrotum and confining it by two strong ligatures in the external abdominal ring, until adhesions take place sufficiently strong to close the opening. I have performed several of the operations recommended, but lately I have adopted the following simple method, when the opening is so large that a truss, no matter how well applied, will not prevent the escape of the contents of the sac. In such cases the upper portion of the scrotum should be pushed up into the ring with the fore and middle fingers of the left hand, and when within the external ring a large curved needle, armed with a strong ligature, should be passed through the skin above the edge of the abdominal ring as well as the scrotum, until the point reaches the finger; then it should be passed under the extremity for about half an inch and brought out about an inch from the point of insertion. If the opening be large, three points of the interrupted suture should be inserted, and a compress the size of the thumb placed upon the space between the extremities of the ligatures, and secured so firmly that it cannot be displaced. The ligatures should be allowed to remain from six to twelve days, according to the degree of inflammation that may result from their presence. A truss should then be applied and worn as long as necessary, which is generally during the life of the patient, as but few permanent cures are made by such operations.

Incarcerated Hernia.—Formerly the victims of this unpleasant difficulty were placed in a horizontal position, and starved to exces-

sive emaciation, with the hope that the adhesions might yield sufficiently to allow the tumor to return. In such cases it is useless to annoy the patient by efforts at reduction, and the treatment should consist of palliatives, such as temperance, with the application of a suitable suspensory bandage.

Strangulated hernia is not only accompanied with pain and the other symptoms enumerated, but is also attended with such great and immediate danger that an effort should be made to reduce it by the taxis as soon as possible.

The patient should be placed upon the back, with the head and knees both sufficiently elevated to relax the abdominal muscles. Chloroform should then be administered until its full effect is produced, then if it be a scrotal hernia take the tumor either in one or both hands and draw it gently outwards, and at the same time make pressure with the thumbs near the external ring; generally the gaseous contents will return, and soon will be followed by the more solid portion. It is neither safe nor proper to apply much force. Skill is more important than strength, and sometimes it is necessary to exercise great patience, yet the efforts to reduce the hernia should not be too long continued, as they might hasten the development of dangerous inflammation. I have frequently when called at night, where the symptoms of strangulation were neither distressing nor violent, after administering half a grain of sulphate of morphia, placed the patient on the back, and in the morning would find that the tumor had disappeared with the symptoms which it produced. Not more than two months since I visited a child, at night, with strangulated congenital hernia; as the parents were unwilling to have an anæsthetic administered, and the reduction being otherwise impossible in consequence of the resistance made by the patient, a sufficient quantity of Dover's powder was given to produce sleep, and in the morning the tumor had disappeared. In such cases there is nothing equal to chloroform; it produces more complete relaxation than all the other medicinal agents combined that have either been employed or recommended, and in consequence of the benefit derived from its use I have only found it necessary to perform two operations for hernia in this city, and I have no doubt that if they had been treated properly it could have been in these cases avoided. When the taxis fails an operation should be performed as soon as possible, and when that is necessary

the part should be shaved, and after the exhibition of an anæsthetic the patient should be placed near the side of the bed, and the incision made the entire length of the tumor. In making the first incision I prefer to raise the skin by the aid of an assistant, and divide it by one stroke of a bistoury to the extent which may be necessary to expose the sac. I adopted that method in consequence of having seen Jobert, a distinguished surgeon of the St. Louis Hospital, in Paris, cut through the skin, cellular tissue, the sac, and all the coats of the intestine by the first incision, which would, in private practice, destroy the reputation of any young surgeon. After the division of the skin and subcutaneous cellular tissue, you may open the sac either slowly or by passing the knife gently in the direction of the external wound, dividing a thin layer each time until the intestine is exposed, or you may raise a thin layer of the sac with the forceps and incise it either with a scalpel or scissors, so as to admit a grooved director, and proceed to divide in the same manner layer after layer until the contents of the sac are exposed. Usually when that is accomplished serum, either bloody or dark in color, escapes, showing that the sac has been opened; the opening should be enlarged until the part strangulated is exposed. The first operation of this character which I performed was for umbilical hernia. It had been strangulated two days, and so soon as the sac was opened so large a quantity of dark serum escaped that I believed the intestine was wounded, which was found, however, to be dark-colored but not mortified, and after dividing the stricture it was easily returned, and the patient recovered.

After opening the sac and exposing the intestine, the forefinger should be passed through the internal ring, between it and the protruding part, and the stricture divided either with a probe-pointed bistoury or blunt scissors.

The incision should be made directly upwards, so as to avoid the epigastric artery, which in ventro-inguinal hernia is on the external or iliac side of the tumor. I always, before making the incision, endeavor to ascertain the position of the artery, so that if its location be abnormal it may be avoided. After the stricture is divided, the condition of the protruding part should be ascertained. Should it be red, livid, or even black, if it has not been long strangulated, and no adhesions exist, it should be returned. Even when adhesions have taken place, if they can be easily destroyed, it should be

done and the parts returned. But if mortification has taken place, the part should be allowed to remain externally, and if the adhesions are not sufficient, a suture should be employed to prevent the return and give the patient the benefit of an artificial anus.

After the operation has been completed, a small portion of wet lint should be placed in the lower extremity of the wound, and the remainder closed by the interrupted silver suture, and treated subsequently as an ordinary wound. When mortification is either imminent or has already occurred, the wound should be left open, so as to allow the contents of the intestines to escape, until a communication between the extremities can be effected by a surgical operation. The forceps invented by Dupuytren are superior to any other instrument that has been used for that purpose. The extremities of the blades are round and flat, and about an inch in diameter. One blade being passed into each extremity of the intestine, they should be closed so as to bring the serous surfaces in contact, but not with sufficient force to destroy their vitality. In two or three days sufficient inflammation is produced to unite the serous surfaces, and then the pressure should be gradually increased, until the coats of the intestine subjected to the pressure are destroyed. I have watched with great interest the use of this instrument in the hands of the inventor, and was not disappointed in the result. So soon as the contents of the intestine can pass readily through the opening made by the instrument, the other speedily closes.

Femoral Hernia.—It is more difficult to diagnose femoral than any other variety of hernia. It may be mistaken, when reducible, for psoas abscess, although it is generally smaller, returns less readily, is less elastic, and is not accompanied with the same constitutional symptoms. It is much less painful than a bubo, and the pulsation that always exists in an aneurism of the artery would enable you to distinguish it from that difficulty. The contents of a femoral hernia pass through the imperfectly closed space that intervenes between the femoral vessels and Gimbernat's ligament, which is formed by the iliac and transversalis fascia, and extends from Poupart's ligament to the crest and ramus of the pubis, and about an inch from the former. On the iliac side it presents a crescentic edge or margin, which in strangulated hernia constitutes the seat of stricture. The directions given, when speaking of the taxis, will apply to every variety of this difficulty, and it now only remains to describe the

operations required in peritoneal, umbilical, and crural hernia. In the latter the incisions should be in the shape of a T, and the transverse cut should be below, but near, Poupart's ligament. Great care should be exercised in this operation, as the sac is not covered by a dense fascia, but only surrounded by the skin, cellular substance, fat, and lymphatic ganglions, which are located between the pectineus and sartorius muscles. The fasciæ only are, therefore, important, as constituting the seat of stricture. After the protruding part is exposed, the finger should be passed up on the inner side, and with it a probe-pointed bistoury directed inwards, to avoid the obturator artery. The ligament should be divided sufficiently to allow the hernia to be reduced, and the wound dressed as already directed.

Umbilical Hernia.—This is almost always congenital, and occurs more frequently in children of African descent than in those of any other variety of the human family. If the general health of the child be good, it is easily cured by a gum-elastic bandage, without the use of a compress. This should be about six inches in width, and never removed, except when proper attention to cleanliness renders it necessary, until a cure is effected. In children, I have never failed to effect a radical cure by the use of this bandage. Should umbilical hernia be neglected, it frequently becomes very large, and may when an additional portion of omentum or intestine is forced into the sac, become strangulated. A crucial incision should be made, and the same precautions taken which were previously mentioned, except that there being no vessels of magnitude in that vicinity, the stricture may be divided in any direction, and the part returned, if in a proper condition, as already specified.

Ventral Hernia.—Ventral hernia usually occurs in adults as the result of violence, and can only be palliated by the application of a bandage or truss sufficiently large to cover the opening and prevent the escape of the abdominal contents, except in the variety which I discovered and was the first to describe in the *Pacific Medical Journal,* as peritoneal hernia. This generally occurs near the linea alba, and ordinarily above the umbilicus. It varies in size, from that of a pea to that of a chestnut. The opening being too small to allow anything except the peritoneum to escape, it rarely becomes larger than specified. Having been repeatedly consulted in such cases, without being able either to describe the character of the disease or afford relief, I determined to remain no longer in ignorance.

Assisted by Dr. Wooster, of this city, the tumor was exposed, and consisted entirely of peritoneum, which was returned by the use of a probe into the abdomen, through an opening not larger than a goosequill. The external wound was closed, a compress and bandage applied, and in two weeks the patient was well, being entirely relieved of the annoyance it produced. I have since operated upon two cases, in which the peritoneum could not be returned. It was removed with the scissors, and the patient recovered as rapidly as the first who submitted to the operation. Other varieties of hernia are described by surgeons, which, however, occur so rarely that they possess but little interest.

When any portion of the abdominal contents passes through the ischiatic notch, it is called hernia dorsalis, and hernia of the foramen ovale or hernia of the perineum when in these localities. When an obscure tumor presents in any portion of the body, and when doubt exists, always resort to the exploring needle, and be guided by the result.

After-treatment.—Generally, in a few hours after the stricture has been removed and the hernia reduced, all the unpleasant symptoms disappear. The bowels frequently act without assistance, and the patient speedily recovers. Should this, however, fail to occur, you must recollect that the strangulated portion of the intestine is more or less inflamed, and it would be injudicious to administer a cathartic before the third or fourth day, and then an enema of salt and water should be preferred, and if that fails, a small dose of castor-oil or citrate of magnesia may be substituted.

After every operation of this character there is danger of inflammation, consequently, so soon as the operation is complete, you should always administer a full dose of some preparation of opium, and repeat it at longer or shorter intervals according to the effect. The pain must be relieved; if it is violent, and the stomach is irritable, either apply the sulphate of morphia endermically or hypodermically, or throw a teaspoonful of the tincture of opium into the rectum. Should inflammation occur, in spite of these precautions, more active means should be employed. Take blood from the arm, or apply leeches, or both, as may be necessary. If the patient be young and vigorous, take at least twenty ounces of blood from the arm. After the vein is opened, have the head elevated and allow the blood to flow until syncope is threatened, and after reaction takes place and

the difficulty still continues, apply as many leeches as the condition of the patient will permit. Fomentations or the warm-water dressing should be applied so soon as the operation is completed, and continued until the patient is convalescent.

After the pain has been relieved by the remedies indicated, calomel and opium should be substituted, in doses corresponding with the urgency of the symptoms, and alternated with the veratrum viride and tincture of aconite, to control arterial action, until the specific effect of the other remedies can be obtained. In peritonitis, as well as in all internal inflammations, the nourishment should be small in quantity and of the mildest character, such as arrowroot, corn-meal gruel, or chicken-water. A solution of gum arabic, or some other mucilaginous drink, should be directed in order to quench the thirst, which is frequently very distressing.

I repeat, do not give a cathartic so soon as the hernia is reduced. Inflammation of the serous coat always paralyzes to a greater or less extent the muscular, and if you force down the contents of the upper portion of the canal, instead of passing through they will accumulate, increase the inflammation, and endanger the life of the patient. Wait three or four days, until the intestine has so far recovered as to act upon the contents, and then a laxative may be administered with the happiest effect.

LECTURE XVI.

GENTLEMEN: The urinary bladder very frequently becomes the seat of, or receptacle for, concretions, which vary in size, number, consistence, color, and composition.

Healthy urine always holds in solution substances which are deposited when it is cold and at rest, which may under certain circumstances cohere and form what is called a urinary calculus. The deposits present an opaque floating substance, whitish or pale-yellow, near the bottom of the vessel, which is either phosphate of lime or the triple phosphate of magnesia and ammonia; or they may adhere to the vessel and present a white or reddish appearance, and are composed usually of either uric acid or the urate of ammonia. The urine may also hold in solution, besides the substances specified, the oxalate of lime, from which is formed the most irregular and painful variety of calculus. All that is necessary for their production under any circumstances is a nucleus. A clot of blood, a portion of mucus, a needle, the extremity of a gum catheter, or any other foreign substance, if free in the bladder, will serve as well for that purpose as a renal calculus, which is the most frequent cause.

Predisposing Causes.—The first and most important is indigestion. When the stomach and liver perform their functions imperfectly there is always an increase of uric acid, and when this is abundant, as in persons who suffer from gout, a small calculus will form in the kidneys. This, after passing through the ureter with great difficulty, and if not speedily expelled by the bladder, will in a short time become a urinary calculus. I treated a case some years ago in this city, of gravel, complicated with gout, and the patient after a very unpleasant night collected twenty-four renal calculi about the size of a buckshot, which had passed during that time through the urethra; if any of them had remained he would soon have experienced the symptoms of stone in the bladder.

Inflammation of the mucous membrane of that organ is a very fruitful source of stone. When a great quantity of mucus is secreted,

should it be too tenacious to pass through the urethra, in a few days a calcareous deposit will be made upon its surface, and a stone produced. I have found it necessary to remove portions of gutta-percha catheters from the bladder, which after remaining two weeks will be found incrusted with calcareous matter, and produce all the symptoms of stone resulting from any other cause. I shall always recollect the case of a lady upon whom I operated in 1835. She, in consequence of being paralyzed, found it necessary to have a catheter introduced two or three times a day to obtain relief. Soon the symptoms of stone became very decided, and, when removed, in the centre was found a cotton thread about an inch in length which had been pushed into the bladder with the catheter.

The nucleus is, however, almost always a renal calculus or gravel, which forms in the kidneys in consequence of derangement of the digestive organs; this, after reaching the bladder, should it remain there a few days, will become too large to pass through the urethra. It is well known that in limestone districts of country this disease is more common than elsewhere. Professor Dudley, who lived in a small town in Kentucky, it is said operated 207 times; but if he had lived either in the South or in California he would not even with his reputation have found so many cases of that character.

Varieties of Stone.—There is contained in the collection which I presented to the College, only one specimen of this variety of stone, which is called the uric acid calculus. It is generally oval, varies greatly in size, and may present either a smooth surface or one covered with small projections. It is usually brown when first removed, but soon presents a whitish appearance, and is distinctly lamellated. It is described as being very common, yet in this State it does not occur so frequently as other varieties.

This calculus is composed of the phosphate of lime; it is small, very smooth, triangular in shape, presents a light-brown appearance, and occurs very rarely. It was removed from a boy in this city about two years old, and he made a rapid and satisfactory recovery.

This immense stone is composed of the triple phosphate of magnesia and ammonia; it is oval in shape, presents a white glistening appearance, and is never laminated, and as you will observe, in this specimen retains its original unbroken appearance.

The fusible calculus, composed of the phosphate of lime and the triple phosphate of magnesia and ammonia, frequently, as you will

see by examining this specimen, acquires great magnitude; they are always laminated, white, and disintegrate rapidly, even when protected, as this has been, from atmospheric influence. A portion of the external layer has been detached, which exposes the one beneath. There are several specimens of this variety in the collection, and in California they are exceedingly large, in consequence of the great length of time, they are usually allowed to remain in the bladder.

This differs entirely from any of the others exhibited. It is nearly round, almost black, nearly as large as a walnut, and the surface is exceedingly irregular; this is the specimen which you all saw removed from a young man in the hospital. It is composed of the oxalate of lime, and from its shape is called the mulberry calculus. It is rough, exceedingly hard, and could not be tolerated if the depressions were not filled with mucus, which is secreted very abundantly by the inflamed mucous membrane of the bladder. Professor Silliman, who examined it during his visit to this State, considered it the largest and most perfect mulberry calculus he had ever seen.

This variety is very rare and always small, and I am much gratified to be able to exhibit this specimen to the class. It is called the cystic oxide calculus, and was removed from a gentleman from Idaho about a year since. In shape it is irregular and yellow; it is very compact, semi-transparent, and presents a glistening appearance. These calculi were analyzed by Professor Price, and their composition ascertained. You cannot always determine the character of a stone by its appearance, and it is not very important, as an opportunity to make an examination does not present until they are removed, and consequently a knowledge of the variety would not influence the treatment.

Symptoms.—I will endeavor to give you the symptoms which should induce you to suspect the existence of a stone. When the patient complains of constant pain or uneasiness in the region of the kidneys and at the extremity of the penis, with a frequent inclination to pass urine, in which, after a paroxysm, small fibrinous clots may be detected, particularly if accompanied with either sickness of the stomach or vomiting, you should suspect the existence of a calculus in the kidneys, and if after these symptoms have existed some time, he is attacked with excruciating pain extending along the course of the ureter of either side, accompanied with retraction of the testicle, which continues for several hours without even being mitigated by

the remedies usually employed for that purpose, you may feel confident that gravel has passed from the kidney to the bladder. If after these symptoms have subsided, pain and difficulty is experienced in passing the urine, and particularly if the flow is sometimes suddenly arrested before the contents of the bladder have been expelled, accompanied with an increase of pain, you should always suspect the presence of a stone. The only way in which you can positively determine it, however, is to introduce a sound or silver catheter, which should be preferred, and if, the bladder being partially filled with urine, the stone cannot be felt, allow the urine to escape, and then it will generally be brought in contact with the extremity of the instrument, and a grating sensation will be imparted to the fingers, which can seldom be mistaken. The prepuce is always elongated, and the penis is generally enlarged, which results from the friction made by the patient to alleviate the pain experienced, particularly during a paroxysm. In either adults or children always use a silver catheter, and make two or three examinations when a stone is suspected before forming a diagnosis. I advise this course because the three last cases upon which I operated were treated in this city for several months for either cystitis or stricture, without the existence of stone being suspected. These cases are mentioned to prevent you from committing a similar error.

Treatment.—Before performing an operation for stone always prepare the patient properly, for upon that your success will greatly depend. Nothing will alleviate the irritation and pain resulting from the presence of a stone in the bladder as speedily as calomel. I cannot give you the *modus operandi,* but I have often observed the effect. Before operating for stone I always prescribe two or three five-grain doses of calomel every alternate night, until the local irritation is greatly diminished, and have sometimes relieved the patient so much that he would consider himself cured, and refuse to submit to the operation until the symptoms returned. The food for a week or more should be simple, easily digested, and so moderate in quantity that it can be easily and readily disposed of by the stomach.

Radical.—To relieve a patient of stone you may either adopt such means as will promote its escape entire, break it into particles small enough to pass through the urethra with the urine, or make an opening sufficiently large to enable you to remove it with

forceps. I have frequently prevented a calculus from forming in the bladder by taking the precaution, after a portion of gravel has passed through the ureter, to direct the patient to retain his urine until the bladder is considerably distended, and then, in a bent position, to expel it as forcibly as possible. In this way the gravel will often be discharged, while if neglected it may in a few days become too large to pass through the urethra, or it may pass from the bladder and lodge in the membranous portion of that canal. I have operated twice upon the same patient within a year to remove a stone from the urethra. The wound healed readily after each operation, and the canal was not contracted. Some years since I removed a stone that had been in the urethra thirteen years, and the patient had been treated for stricture. The stone was larger than a chestnut, yet the urine was voided without much difficulty; the wound healed in two weeks, and he has experienced no inconvenience from the dilatation of the canal that must have existed to accommodate so large a foreign substance. In cases of this character, except when they are accidental, you will find derangement of the digestive organs, particularly of the stomach and liver, with more or less constipation, which should be corrected in order to prevent a recurrence of the difficulty.

The next method of removing a stone is to crush it so effectually that the particles will pass through the urethra. To Civiale, of

Fig. 57.

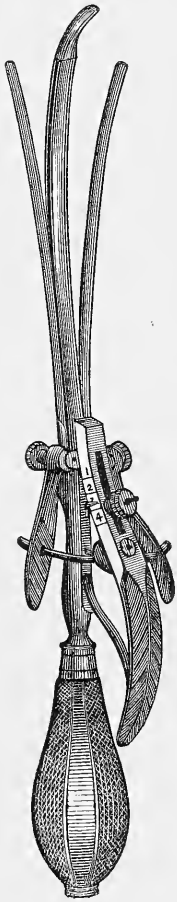
Paris, is due the credit of directing the attention of the profession to this subject, as well as of having been the first to perform this operation successfully. The first instrument he used for that purpose would have been exceedingly dangerous in less skilful hands, and was soon abandoned. Several instruments of this character called "*brise-pierre,*" or stone breakers, which are slightly curved, strong, and well adapted to that use, have been invented, the best of which is represented in Fig. 57. The surgeons who were most conspicuous in the treatment of stone by this method, which is

lithotrity or lithotripsy, are Amussat, Leroy, Heurteloup, and Civiale. I have seen Civiale operate frequently, and I know that no man possessed more manual dexterity or was better acquainted with the diseases of the urinary organs. During my stay in Paris I had access to both the Necker and Hôtel Dieu Hospitals, and witnessed the operations of both Civiale and Dupuytren, and upon comparing the results I came to the conclusion that except in the hands of specialists, of men of extraordinary manual dexterity acquired by experience, the knife is safer than the écraseur. Lithotrity is not applicable to children or boys. The parts are not only too irritable, but the urethra is also too small to receive an instrument sufficiently strong for the purpose. In adults, when the stone is small and there is neither stricture, enlargement of the prostate gland, nor ulceration of the bladder, this operation is applicable. Before introducing the instrument calculated to break or crush the stone, if the bladder be empty, some tepid water should be injected through a catheter and retained until the instrument is introduced. The patient should be placed upon the back; when the extremity of the instrument comes in contact with the stone the blades should be separated, and when it is within their grasp sufficient force should be applied to obtain the desired result; should the first operation fail, so soon as the irritation subsides, which sometimes occurs in three or four days, it may be repeated. When the stone is large and hard this treatment is frequently not only tedious but dangerous, and sometimes it becomes necessary to abandon it and resort to the knife.

Lithotomy consists in cutting an opening sufficiently large to enable you to introduce large forceps into the bladder and remove the stone. Different methods have been recommended and advocated. Frère Jacques, a friar, was the first to remove a stone by making a free incision. After having frequently witnessed the suffering of the unhappy victims of this disease, and being a man of strong common sense, he came to the conclusion that as he could feel the stone by passing his fingers into the rectum, if it were drawn down forcibly against the perineum it might be removed by cutting down so as to divide the parts that intervened. He often succeeded by pursuing that course, but he undoubtedly frequently wounded parts that should have been avoided. The first improvement made in this operation was by Cheselden. He recommended what is still called the lateral operation, in which the incision extends from the

inferior portion of the scrotum obliquely downwards, and terminates between the anus and the tuberosity of the ischium on the left side. The rectum in this operation is on the left side of the incision, and the pudic artery on the right, which are the most important parts in the vicinity of the wound. Before performing any operation of this character, the rectum should be emptied by an enema, and then you should examine its size, and make the incision so that it will not be endangered. After reaching the staff, and before the urethra has been divided, should you find that the rectum has been wounded, the operation should not be completed, but that for fistula in ano substituted, and when the wound heals, the operation for stone can be performed with as good a prospect of success as if the accident had not occurred.

Fig. 58.



Frère Côme invented what he called the lithotome caché, with one concealed blade, with which he performed the lateral operation, which I think is superior to the instruments now employed for that purpose. But for the instrument exhibited, with two concealed blades, called the double lithotome caché, we are indebted to Dupuytren, the greatest genius of his age, and with it he performed the bilateral operation, which I think should always be preferred. In expressing this opinion, I am aware that I differ with many able surgeons, yet I think that I can convince every member of this class that the bilateral is more easily performed and more successful than any other that has been practiced. Before commencing the operation, pass the grooved staff into the bladder, for the purpose of giving your assistants the privilege of feeling the stone, and deciding upon the necessity of an operation. The table should be high, strong, and about three feet in width. It should be covered by a blanket, protected by oiled-cloth, over which a cotton sheet may be thrown. The head should be supported by two pil-

lows, and the hands and feet secured firmly together by a roller bandage. The perineum should project beyond the edge of the table, and a tub should be placed so as to receive the blood and urine which must necessarily escape when the incisions are made. When the grooved staff is introduced, it should be held by an assistant on the left side, in order that he may use the right hand. Should the urethra be small or strictured, a small staff may be substituted for the size usually employed, which I found necessary a few days since, in an old gentleman from Mexico, whose urethra had been lacerated by a surgeon of Hermesilla in endeavoring to pass a catheter into the bladder.

After the necessary preparation has been made, in the bilateral operation, make a semilunar incision three-fourths of an inch above the anus, which should extend from the tuberosity of the ischium on the right, to the same point on the opposite side. The first incision should divide the skin and superficial fascia, and then, with the finger of the left hand in the rectum, the wound should be deepened, so as to divide the transversalis muscle and deepseated fascia, and probably the artery, although that may escape. The second incision should be sufficiently deep to expose the membranous portion of the urethra, so as to avoid the artery of the bulb, which might give rise to troublesome hæmorrhage. Before dividing the urethra, one finger being in the rectum, the forefinger of the right hand should be passed into the wound, so as to determine positively that the rectum has not been wounded, and then the blade of the scalpel should be turned upwards, and the urethra divided so as to expose the groove in the staff. When reached, it can be easily ascertained by the sensation imparted to the fingers with which the knife is held. The beak of the lithotome should then be placed in the groove of the staff, and passed into the bladder, with the curved side towards the rectum. The position of the lithotome should then be reversed, and the staff removed. When elevated, so that the back rests against the pubes, the blades should be opened, and the instrument drawn out horizontally, so as to avoid wounding the rectum.

With this instrument I have operated thirty-seven times, and have never had, except in two cases, a troublesome hæmorrhage. The first occurred in a boy twelve years old, and the second patient was a man aged sixty-six years, who was exceedingly emaciated, and upon whom I operated only three weeks ago. When placed upon

the table, his pulse, being counted by Professor Morse, was one hundred and sixty-eight in a minute. Two calculi were removed, and although the hæmorrhage was considerable, it was speedily arrested by passing a large gum catheter into the bladder, and plugging the wound with lint. From the result in these cases, I believe, even when there is no hæmorrhage, it would be better to pass a gum catheter into the bladder, and fill the opening made by the scalpel with lint. It not only prevents hæmorrhage, but also infiltration of urine, which is the greatest danger to be apprehended from the operation.

In the lateral operation the preparation should be the same. The external incision should extend from the posterior part of the scrotum to the centre of a line running from the anus to the tuberosity of the ischium. The same precautions are necessary in order to avoid the rectum, and when the membranous portion of the urethra has been opened, and the staff exposed, the neck of the bladder may be divided either with a probe-pointed bistoury, a long-handled scalpel, or the gorget, which was the instrument Professor Dudley always used. In this operation, whatever instrument is employed, the incision is confined to the left side of the prostate gland, and cannot without danger be extended. If the gorget be used, the beak should be placed in the groove of the staff, and then passed horizontally into the bladder. If a bistoury or scalpel be preferred, they should follow the groove until they have passed into the bladder, and an incision made as extensive as may be necessary to remove the stone. I performed the lateral operation three times with the gorget successfully, yet I prefer the bilateral method, and you may ask why? I prefer it because the greatest danger in the operation of lithotomy arises from the division of the prostatic fascia. The prostate gland in the adult is usually twenty-one lines in diameter, and when the fascia by which it is surrounded is not divided, there is very little danger of infiltration of urine. In the lateral, if the stone be large it would be impossible to remove it without making an incision more than ten lines in length, which would expose the patient to a complication which is almost always fatal. In the bilateral operation you may cut fifteen or even eighteen lines with perfect safety, and through an opening of that size you can remove such stones as I have exhibited without difficulty, because besides the incision you have the benefit resulting from the elasticity of the parts. In chil-

dren the instrument should be gauged so as to cut only ten or twelve lines, which makes an opening large enough to admit the finger, and then with common dressing forceps you can easily remove the calculus. I have never lost a child after an operation for stone, and have upon them always performed the bilateral operation. Of the thirty-seven operations performed with the same instrument only two were lost, one from inflammation of the bladder, the other from pyæmia on the twenty-second day, and when the patient was considered convalescent, the urine having passed through the urethra for five or six days before the symptoms of pyæmia were decided.

The next operation of which I will speak is the suprapubic. The incision is made in the linea alba, above the pubis, but below the peritoneum. Civiale occasionally performed it when the stone was very large, but I have never met with one so large that it could not readily be removed by the bilateral operation. Should you, however, after a careful investigation, arrive at the conclusion that its removal would lacerate the parts implicated extensively, then the suprapubic operation would be justifiable. The bladder should be filled with tepid water so as not to endanger the peritoneum. The incision should be three or four inches in length, according to the size of the stone, and when the bladder is exposed an incision should be made, and the stone removed with the ordinary forceps. A catheter should be kept constantly in the bladder, and the patient confined on his back until the danger of infiltration has passed, which under such circumstances is always fatal. Consequently I would advise you always to perform the bilateral operation, and if the stone be large, crush it and remove the fragments. The forceps which I exhibit would crush any calculus, and the operation would be less dangerous than that usually performed above the pubis, and much less difficult. Sanson, who was one of the surgeons of the Hôtel Dieu in Paris, in 1833, removed calculi through the rectum. The operation was easily performed, but as in almost every case it was followed by a vesico-rectal fistula, which is always incurable, I think this method should never be selected. Many able surgeons both recommend and practice the lateral operation, but I think it is because they have never performed the bilateral. With the double lithotome caché the extent of the incision can be positively determined. The incision is made much more easily than with the gorget,

because the blades are not expanded until it is withdrawn from the bladder. The first operation I performed with the gorget the handle of the instrument was not sufficiently depressed, so that its edge came in contact with the staff, and some difficulty was experienced in its introduction. If the lithotome be used it passes readily into the bladder, when the staff should be removed, and if possible the extremity of the instrument should rest upon the stone. The position of the instrument should then be reversed, and the convex side turned towards and brought in contact with the pubes. The blades should then be expanded by pressing firmly upon the spring, and the incision made by drawing the instrument horizontally outwards. This subject will be continued in the next lecture.

LECTURE XVII.

GENTLEMEN: Having described the different varieties of stone, and the operations by which they can be removed, I will now proceed to the consequences that may arise from such operations. No matter how skilfully the knife may be used, you must not expect that every patient will make a safe and rapid recovery. If that were the case there would be no pursuit so delightful as the practice of surgery.

The first to which I will refer is collapse, by which you should understand that a patient will sometimes become suddenly and unexpectedly prostrate. Under such circumstances the pulse is scarcely perceptible, the breathing is labored, the extremities are cold, and it is difficult if not impossible to produce reaction. Such cases have occurred in this as well as in other surgical operations, but as long as I have been a member of the profession I have never had a patient either to die on the table, or sooner than five days after being operated upon. I have always thought that it is an evidence of bad surgery. It indicates either that too much blood has been lost, that the patient has been subjected to too great or to unnecessarily protracted pain, or that he was not in a proper condition to undergo an operation. Before the discovery of chloroform I always operated as rapidly as possible, and even since its discovery I can find no reason that will justify delay. The parts being at rest, and no resistance being offered, every operation should be performed with as much expedition as is compatible with safety. You have all seen the operation of lithotomy performed in fifty seconds; it should never occupy more than four minutes, and unless the opening made be too small, and great violence be offered the parts in the vicinity, but little danger need be apprehended. When prostration does occur, you should apply heat externally, as by bottles filled with hot water, and administer stimulants as rapidly as the condition of the patient would appear to indicate.

Hæmorrhage.—The next and a much more frequent difficulty is hæmorrhage. In the forty operations which I have performed, it

occurred twice. The first time was in a boy twelve years old, and the second in an old man of sixty-six years. In both cases the vessel was deepseated, and the hæmorrhage could only be arrested by pressure, which was easily made by passing a straight silver or gum catheter into the bladder, and plugging up the wound carefully around the catheter with dry lint, from the prostate gland to the integument. Both the catheter and lint should be secured by a well-adjusted T-bandage. In such cases leave nothing to chance; plug up the wound yourself, because you are more interested than an assistant, by reason of the responsibility devolving upon you. The lint is usually detached from the surface of the wound in five or six days, and then the catheter may be removed with safety. The hæmorrhage which might result from a wound of any vessel in that vicinity may be arrested by pressure, except from the pudic artery, which is only endangered in the lateral operation. That vessel can be secured by strong spring forceps, and by allowing them to remain a few days a fatal hæmorrhage may be prevented. I pursued that course in a case in which the inferior thyroid was wounded, with the most satisfactory result. Hæmorrhage is always an unpleasant occurrence after any operation, and you should take every precaution to prevent it.

Infiltration of Urine.—This is the most serious consequence of the operation for stone. I have never lost a case from that cause, but it does occasionally occur, and I am satisfied more frequently in the lateral than bilateral operations, because if the stone be large, in the former it frequently becomes necessary to divide or tear the prostatic fascia. In this case infiltration is exceedingly liable to occur, and when it does it is almost always fatal.

Inflammation.—After every operation of this character inflammation may be set up. Of the forty patients operated upon by me, one died of cystitis on the seventh day, and another in about three weeks, of pyæmia, which as you know is one of the consequences of inflammation. You may have cystitis alone, or it may extend to the peritoneum, and be accompanied with all the symptoms of that fatal difficulty. The patient who died of cystitis was sixty-six years old, and very feeble in consequence of the irritation produced by the stone, and of albuminuria, from which he had suffered for several years. The largest stone in our collection was taken from him. It is so large that even with an incision of eighteen lines it was re-

moved with great difficulty. The operation was only performed to gratify his friends, and give him the only chance which remained for life. When inflammation supervenes it should be treated according to the indications. If the patient be young, apply leeches and fomentations, give calomel and opium, and relieve the pain by laudanum injections, which will act more speedily than opiates taken into the stomach, and can be resorted to when that organ is too irritable to retain any medicine. Mucilaginous drinks may also produce a good effect, but I rely chiefly upon the preparations of opium.

Recto-vesical fistula may result from the operation of lithotomy. It was in order to avoid this that I cautioned you so particularly to ascertain, before dividing the urethra, whether the rectum was wounded, and if even the slightest wound be detected, the sphincter ani should be divided and the case treated as one of fistula in ano. There is nothing so unpleasant as a urinary fistula of this character. It is incurable, and renders the subject, no matter how much attention he may pay to cleanliness, an object of disgust. On that account, I object to the operation practiced by Sanson at the Hôtel Dieu. He operated through the rectum, and his patients always suffered from this loathsome infirmity.

Females occasionally suffer from urinary calculi. The first operation I performed, after returning from Europe, was upon a female who had been paralyzed for several months, with retention of urine. Her servant, in passing a female catheter, pushed a coarse cotton thread into the bladder, which served as a nucleus for an immense stone. Although the general health of the patient was greatly impaired, besides the existence of paralysis, the urethra was divided bilaterally with the lithotome, and a stone the size of a turkey's egg removed; the patient made a rapid recovery. This operation in the female is exceedingly simple, but still I would not recommend it, except in such a case as I have described. The operation of lithotrity, when the stone is large, and the bladder can expel the fragments, should be preferred, and, if it be small, the urethra should be dilated with sponge tents or the forceps sufficiently to admit the dressing forceps and to allow the stone to be extracted. There is much less danger in the operation of lithotrity when performed on females, because the instrument is more easily introduced. But little difficulty is experienced either in seizing the stone or in removing the fragments after it has been crushed. The subsequent treatment

should not differ from that which is recommended in similar operations upon the other sex.

Retention of Urine.—Females sometimes suffer from retention of urine, but not very frequently. It may result from overdistension; in other words, whenever the bladder is excessively distended it loses its contractile power, and the use of the catheter becomes necessary to give relief. I have met with cases of this character, where females are so situated that they cannot attend to their wants until this condition exists, and then they find it impossible. It is generally not only necessary to pass a catheter, but also to repeat the operation three or four times a day, until the function of the organ is restored. When the occasional use of the instrument is not sufficient, a male gum catheter should be introduced, and the urine allowed to flow off constantly until the difficulty disappears.

Retention of urine sometimes results from the pressure exerted by the gravid uterus. In such cases the urine generally passes readily when the patient is on the back. It is, however, an exceedingly unpleasant symptom, whether it appears at the commencement or at a more advanced period of gestation. The same difficulty may result from retroversion of the uterus, which can only be relieved by passing the finger into the rectum, in order to change its position, and when the womb is restored to its proper position, it may sometimes become necessary to introduce a pessary to prevent a recurrence, although I think that they are only admissible in such cases.

Incontinence of Urine.—Incontinence of urine is more common than retention. It may occur in either sex, and is an exceedingly unpleasant infirmity. Children from eight to twelve years of age are unable to retain the urine at night, and are frequently punished by their parents, with the expectation that it can in that way be prevented. The best remedy I have ever prescribed, is a combination of tinct. lyttæ and tinct. nucis vomicæ with simple syrup, exhibited in five-drop doses, three times daily. The muriated tinct. of iron, when anæmia exists, is sometimes successful in removing the inability, although in a majority of cases the tinct. lyttæ and nucis vomicæ will more certainly afford relief. By producing irritation of the neck of the bladder, the sensibility is so much increased that the patients become conscious of the call to pass the urine. When internal remedies fail in male children, a strip of gum-elastic should be placed around the penis when the child retires, sufficiently tight

to prevent the possibility of such an occurrence without its removal. By adopting this treatment you can frequently cure cases that have resisted internal treatment in a very short time. It destroys the habit, and seems to increase or restore the natural sensibility of the organs. I have recently relieved a very interesting boy, twelve years old, of this infirmity, after every possible method of internal treatment had failed.

Gonorrhœa.—In consequence of many of the diseases of the urinary organs having their origin in gonorrhœa, I will endeavor to render you familiar with that before proceeding with their consideration. Gonorrhœa is an inflammation of the urethra, accompanied with a discharge, which generally presents a thick yellowish appearance, although it may be either whitish or green, according to the mildness or violence of the inflammation. The discharge is not very unlike pus both in color and consistence; it always results from impure connection, and makes its appearance usually in from one to four days. The time depends upon the virulence of the discharge and the susceptibility of the subject. It is called by the French *chaude pisse*, which expresses one of the most common and distressing symptoms of the disease, and one which usually precedes the appearance of the discharge; at least it is generally felt before the other is observed. When the disease is either neglected or not properly treated, another very painful and annoying symptom, called chordee, frequently occurs several days after the discharge, and depends upon the thickening and induration of the urethra produced by the inflammation, which diminishes or destroys the elasticity of the urethral canal. Sometimes when the urethra is excessively inflamed, a laceration of the mucous membrane takes place during an erection, which may be followed by hæmorrhage so profuse as to afford temporary relief. You may all have been led to think that you can cure any case of gonorrhœa, and that it is exceedingly simple, both in character and treatment. I, however, after long experience, beg leave to differ with you. I think that under the circumstances in which most of such patients are placed, it is one of the most difficult diseases to cure that you will be required to treat. Should the patient be in a hospital, where his diet, exercise, and medical treatment can be properly regulated and enforced, you will often have no difficulty. Exercise should be prohibited. You order a saline cathartic, mucilaginous drinks, the application of cold water externally, with low

diet until the acute symptoms disappear; then you can resort to the curative treatment with a certainty of success. Should you expect to cure this disease in one or two weeks in a laboring man, who is obliged to eat heartily to sustain his strength, you will almost always be disappointed. You must treat him with the ordinary remedies, which under such circumstances fail to produce their usual effect. There are only two articles of the Materia Medica which I have found, when administered internally, to exert a specific influence over this disease, and they are balsam of copaiba and cubebs. The best way to give the former is in the shape of capsules, and the latter may be given in powder, tincture, or in an electuary in combination with conserve of roses, or something equally agreeable. The greatest objection to the use of copaiba is the unpleasant taste, which is removed by enveloping it in such a manner that it will reach the stomach without offending either the sense of taste or smell. Six of Planten's capsules in twenty-four hours are as many as can usually be taken without either producing sickness of the stomach or acting too freely upon the bowels. Of the powdered cubebs I usually direct one teaspoonful three or four times a day in water, or a teaspoonful of the tincture as frequently repeated, when the powder is offensive to the stomach. By the use of either of the articles mentioned, in four or five days the discharge usually diminishes in quantity and changes in appearance; then the following injection should be prescribed, not only to arrest the discharge, but to prevent its recurrence:

℞.—Zinci Sulph., ... gr. xvi.
Tinct. Opii, ... ʒiv.
Aqua Font., ... ℥viiss.
M. Sig. Inject three times a day.

Formerly I used injections much stronger than the one recommended, but they were abandoned because the discharge was sometimes checked too suddenly, producing consequences more serious than the one under treatment. The injection should be repeated two or three times a day; throw it well into the urethra, have it retained from two to five minutes, and continued, with the internal treatment, at least ten days after the discharge ceases, in order to prevent a return. The urine should be passed a short time before the injection is used, so as to expose the mucous membrane to the action

of the remedy, and prevent the discharge being carried back, should the injection pass beyond the point diseased. Should a change be considered advisable, the acetate of lead or zinc in the same strength may be substituted, as well as the chloride of zinc, one grain to the ounce of water, which is by some physicians considered superior to any other remedy of this character. I have found a solution of the perchloride of iron, one drachm to eight ounces of water, exceedingly valuable when used only twice a day, and particularly in cases in which a predisposition to orchitis is decided, which sometimes renders the treatment of gonorrhœa very difficult.

A solution of the nitrate of silver, from ten to twenty grains to the ounce of water, was in fashion some years since to effect what was called the abortive treatment. The solution was injected two or three times a day, until violent inflammation of the urethra was produced, and then a milder treatment substituted. This treatment is only justifiable when a domestic difficulty can be avoided by its adoption. In all other cases I am confident that whoever has seen the bad consequences that follow as frequently as I have, would never resort to it as a general practice. As it sometimes produces a permanent induration and contraction of the urethra, other astringent injections are sometimes employed, such as a weak solution of the sulphate of copper or iron, which I cannot recommend, although, under certain circumstances, I think I have derived considerable benefit from the use of a five-grain solution of alum to the ounce of water, particularly after the inflammatory symptoms have subsided, when in cases of idiosyncrasy the copaiba produces a cutaneous eruption. Should cubebs be obnoxious to the patient, twenty drops of the solution of the perchloride of iron three times a day should be substituted. In the treatment of gonorrhœa, particularly in office patients, unpleasant symptoms frequently occur. Whether an injection be used or not, so soon as the discharge either diminishes or ceases entirely, great irritability of the prostatic portion of the urethra takes place, indicated by a frequent inclination to pass the urine, accompanied with considerable pain, which is exceedingly annoying, and can only be relieved by restoring the discharge, and if that cannot be effected in a few days, the irritation will extend to one or both of the testicles, and orchitis will be the result. In such cases the specific treatment should be abandoned, a warm bath should be

recommended, with mucilaginous drinks, and the following mixture given internally:

℞.—Tinct. Pip. Cubebæ, ... ℥iij.
Vin. Colch. Seminis, ... ℥j.
Morph. Sulph., ... gr. iv.
M. Sig. Take one teaspoonful four times a day, or more frequently if necessary to afford relief.

In a few hours the pain is generally relieved, and the discharge returns, but in obstinate cases, to prevent orchitis, a dozen or more leeches should be applied to the perineum and the medicine continued. After the subsidence of the pain and the restoration of the discharge the case should be treated as before, except that great care should be taken to stop the discharge gradually in order to prevent a return of the same symptoms.

Some years since many eminent physicians were opposed to the use of injections in the treatment of gonorrhœa. The first essay I prepared on a medical subject was read before the Medical Society of the Transylvania University against their use in this disease. I now, however, entertain an opinion very different from the one I then expressed, so different that I believe that the disease can seldom be cured without them, and the only change which experience has induced me to make is to diminish their strength. Formerly I used twenty grains of the sulphate of zinc to eight ounces of water, and now only from twelve to sixteen, and with it I usually combine half an ounce of the wine or tincture of opium. If the disease has existed for several weeks, or if it be a case of gleet, the injection should be thrown as far into the urethra as possible, retained five minutes, and continued at least ten days after the discharge has ceased. The reason that so many fail to cure gonorrhœa, and that so many cases of stricture occur, is that as soon as the discharge is checked the remedies are discontinued, and in three or four days the difficulty returns. I have endeavored to ascertain the time necessary to continue the treatment, and feel satisfied that ten days are always required to prevent a return of the discharge. After the inflammatory symptoms have disappeared, should a slight discharge continue, a large metallic bougie should be introduced at least three times a week, and be allowed to remain from twenty to thirty minutes. Nothing seems to remove the distended and relaxed condi-

tion of the vessels so speedily and effectually. I have by its use cured many cases of gleet that had resisted the ordinary treatment for months, and even years, in which there existed merely a congested and thickened condition of the mucous membrane. You should not mistake the discharge which occurs in gleet for spermatorrhœa, which in California is very common. In the former the discharge is generally yellowish, thin, and stains the linen, whilst in spermatorrhœa it resembles albumen, is transparent, tenacious, and appears generally either when at stool or after an erection. This disorder is often treated as a gleet, to the injury of the patient, as will be hereafter more fully explained. Besides the discharge, in gleet there sometimes exists in the urethra a want of elasticity, which requires besides the remedies already recommended the use of external applications, such as the tincture of iodine, which may be applied with a camel's-hair pencil to the skin, over and in the direction of the urethra, or mercurial ointment, which should be spread upon lint, and kept in contact with the part affected by the use of a bandage. To prevent painful erections at night, either in gleet or gonorrhœa, give from five to ten grains of camphor at bedtime, or introduce one grain of opium into the rectum, either of which will give temporary relief until the cause can be removed.

LECTURE XVIII.

GENTLEMEN: During the treatment of gonorrhœa, as I have already mentioned, the discharge sometimes ceases suddenly, the neck of the bladder becomes inflamed, and if the difficulty is not properly treated the inflammation will extend to the testicles, although it is generally confined to one side, and may be called either orchitis or hernia humoralis. The pain is always distressing, and in some cases both constant and excruciating; it frequently extends up the spermatic cord to the loins. The organ generally swells rapidly, partly because of the distension of the vessels, and partly because of the accumulation of serum in the tunica vaginalis, produced by inflammation of the serous membrane.

Treatment.—This should be both general and local. Either a sufficient number of leeches should be applied to the scrotum to abstract six or eight ounces of blood, or, which is decidedly more expeditious and equally effectual, the scrotum should be punctured with a lancet, from two to five punctures being made. Should any difficulty be experienced in arresting the hæmorrhage, either Monsel's salt should be applied, or a small pin be used as recommended in my lecture on hæmorrhage. When the scrotum contains serum, the lancet should, at one point, pass through the tunica vaginalis to allow it to escape and remove the pressure, which is always painful. This method of depletion will afford relief.

The best external application is a tobacco poultice, which may be prepared with either cut or twist tobacco; but the leaves wet with warm water, and applied four or five double, are preferable to either. Tartar emetic has unquestionably great influence over these organs. Twenty years ago I relied upon it entirely in such cases. The pain usually disappears as soon as vomiting occurs, which, however, to most patients is more unpleasant than the disease itself. I now give a combination of:

℞.—Vin. Col. Sem., ... ℥j.
Tinct. Pip. Cub., ... ℥iv.
Morph. Acetat., ... gr. v.
M. Sig. Take one teaspoonful every three hours.

This with the other remedies will afford relief; and when that has been obtained, the mixture should either be given at longer intervals or the quantity diminished, and continued, with the occasional administration of purgatives, until the inflammation subsides and the discharge returns. Sometimes when orchitis is neglected or inefficiently treated, suppuration takes place, which may destroy the function of the organ. I have found scrofulous subjects most liable to this difficulty, and when in such cases it does occur, a long and well-directed course of medical treatment is required to save the organ, even with a loss of its function. In favorable cases when the inflammation subsides, the epididymis sometimes remains enlarged and indurated, which will render the use of a sorbefacient necessary to remove the difficulty. In such cases I have found the ungt. hyd. mitis, when spread upon thin chamois leather, and kept constantly applied by the use of a suspensory bandage, superior to the tincture of iodine, which, even when diluted, produces so much irritation of the skin that it frequently becomes necessary to discontinue its use before its full effect has been obtained. You will frequently meet with cases of gonorrhœa in which injections, even of the mildest character, have a decidedly injurious effect, being always followed either by inflammation of the neck of the bladder or by orchitis, so soon as the discharge is arrested. In such cases, if the habit be full, apply leeches to the perineum, give the remedies already enumerated internally, and when the discharge becomes thin and the quantity is greatly diminished, I have found the iodide of potassium very useful. It controls the action of the capillaries of the mucous membrane, and when combined with the judicious use of the bougie, will generally supersede the necessity of resorting to other remedies. It is particularly useful when some thickening and induration of the mucous membrane of the urethra exists, which if neglected will result in stricture, which is one of the most unpleasant consequences of this troublesome disease. Stricture may be produced either by a thickening and induration of the mucous membrane of the urethra, or by the deposition and organization of plastic lymph around the canal, by which its calibre is diminished. A stricture may be either soft or indurated; the former is much more simple, yields more readily to treatment, and is much less liable to return. Some writers describe what they call spasmodic stricture, but I must confess that I have never met with a case of that character. Sometimes in gonorrhœa,

when considerable inflammation exists, the patient will find it either difficult or impossible to pass the urine, which results from the swelling of the mucous membrane and not from a spasmodic contraction. The best proof I can offer of the correctness of this opinion is that the introduction of a catheter is always in such cases followed by hæmorrhage, which in quantity corresponds with the violence of the inflammation. A muscle cannot act without rest more than ten minutes, and if you were to meet with a case of spasmodic stricture, all that is necessary is to press the extremity either of a bougie or catheter gently and steadily against the point of resistance, and it will yield.

A soft stricture, which results from vascular distension of the mucous membrane of a portion of the urethra, can be easily and speedily removed by dilatation. In such cases never employ elastic bougies; when large they are passed with difficulty, and always do more or less violence to the prostatic portion of the urethra, provided they be sufficiently large and strong to overcome a troublesome stricture. Very small metallic instruments are also objectionable in consequence of the danger of lacerating the urethra, which is always an unfortunate occurrence, and when followed by urinary infiltration is highly dangerous. Should the contraction in such cases be so great that the urine will not pass even in a small stream, the patient should be placed upon the back, and a No. 2 or 3 silver catheter should be passed, until the point of the instrument rests against the obstruction, and retained there fifteen or twenty minutes under gentle pressure before a second effort is made to pass it through the stricture. But little force should be employed at first, and if much difficulty be experienced in passing the stricture, the effort should be renewed every alternate day, until the obstruction is overcome. The size of the instrument should be gradually increased, until the canal is restored to its original dimensions; during the treatment, should the discharge continue, I have found the perchloride of iron, half a drachm to eight ounces of water, if thrown into the urethra with a large penis syringe, and retained three or four minutes, superior to any other injections that can be employed. The bougie should not at first be allowed to remain long in the bladder, or even in the urethra, as its presence frequently produces so much irritation as to be followed directly by a protracted chill and violent fever, or even by a succession of paroxysms. When a difficulty of this character is apprehended, a narcotic should be administered. Some entertain

a high opinion of aconite, yet from my experience I do not think it is equal either to a quarter of a grain of the sulph. morph., or a wine-glassful of brandy, or any other alcoholic stimulant given soon after the instrument has been removed. The pressure produced by the weight of the hand, even if the instrument be small, will not lacerate, but it will dilate the urethra, as the mucous membrane, even when indurated, cannot resist the action of a metallic instrument.

When a stricture results either from a cicatrix or from the deposition and organization of plastic lymph, the treatment becomes not only more tedious and difficult, but also requires more skill. Besides many of the same character which I have treated, three have occurred within the last year that had resisted the use of the bougie for six months in the hands of respectable physicians in this city. In one case the injury was produced by the rope, to which a bucket was attached, and in which a man was descending into the main shaft of the Gould & Curry mine, having parted several feet from the bottom; his perineum was resting upon the edge of the vessel, and with the urethra, was so much contused that retention of urine resulted from the accident. It ultimately became necessary to puncture the bladder through the rectum to afford relief. The perineum, in consequence of the infiltration of urine which resulted from the injury, sloughed, and a perineal fistula remained, with a stricture which would not admit the smallest metallic bougie. Even in this case, which was one of the most aggravated character, I succeeded by dilatation. The extremity of the smallest instrument was held firmly in contact with the cicatrix for half an hour every evening, until ulceration took place, and it passed into the bladder. The bougie was then introduced every alternate night, retained half an hour, and the size gradually increased until a No. 12 passed through easily and without pain. He was then directed to use the bougie every week for several months. So soon as the natural channel for the urine was restored, the fistula healed, and in three months the man left the city entirely relieved. Of the other cases referred to, in one the stricture was produced by a fall from a stable loft upon the edge of a manger, and in the other from being crushed in a tunnel, the bones of the pelvis and thigh being fractured at the same time. They were both treated in the same manner, and with a similar result. Should a stricture, when that is possible, be divided by one of the cutting instruments used for that purpose, if the bougie

is not used properly, the wound will heal, and the contraction become as great as before the operation was performed.

Fig. 59.

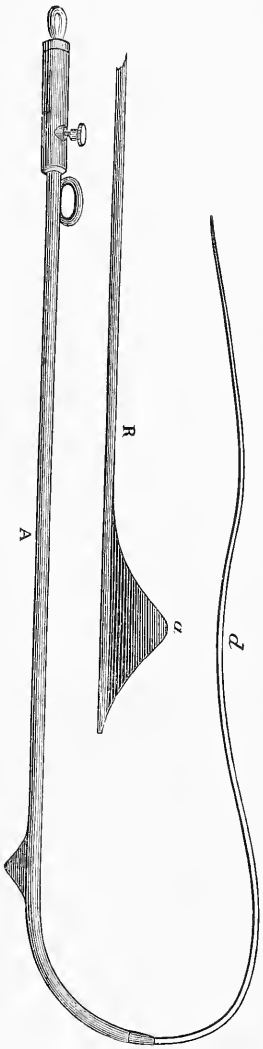


Fig. 60.

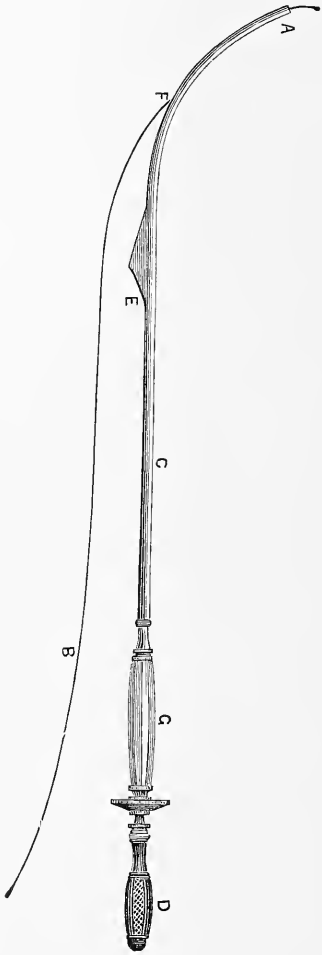


Fig. 59 shows an instrument for cutting strictures, the long flexible tip, *d*, serving as a guide. Within the stem, A, there runs a rod, R, carrying the small blade, *a*.

Fig. 60 represents another form. A fine whalebone, B, being passed through the stricture, and the instrument, C, slipped over it, being tunnelled from A to F for this purpose.

In indurated stricture, which usually results from gonorrhœa, the same treatment should be adopted, except that a No. 3 silver catheter

should be preferred, which in five minutes will dilate the stricture without the slightest risk of producing a false passage by lacerating the urethra. The bougie should not be passed oftener than every forty-eight hours, should be allowed to remain about half an hour, and should be used once a week for at least a year to prevent a recurrence of the difficulty. Although my practice in this class of diseases has been very extensive, I have never found a case of stricture that could not be cured by dilatation, unless the urethra had been torn and a false passage made before it came under my care. As long as I have practiced surgery, I have never punctured the bladder but once for retention of urine, and in that case a false passage had been made which rendered it impossible to pass the catheter. Syme's operation was subsequently performed, and the patient recovered sufficiently to return home, although not entirely cured. In conclusion I beg leave to repeat, except to relieve the bladder when that organ is paralyzed, never use a gum catheter, and then the instrument should be small, because when large it lodges against the prostate gland, and if this be repeated frequently it produces inflammation of that organ, which is always exceedingly difficult to control. The gum-elastic catheter is not only more difficult to introduce, but it gives more pain when it is removed, in consequence of the urethra adhering more closely to it than it would to a polished metallic instrument. You cannot cure a stricture, either when indurated or resulting from a wound, by the use of an elastic bougie, no matter how long or how skilfully it may be used. The metallic bougie by its hardness produces absorption of the organized deposit more rapidly, is much more easily introduced, is less painful when in the stricture, and can be removed with much less difficulty than any instrument made of either gutta-percha or gum-elastic. In some cases, the urethra becomes so contracted that the flow of urine is entirely prevented, the bladder gradually distends, and if not relieved, the parietes will yield to the pressure of the contents, and death will result from the escape of the urine into the peritoneal cavity.

In a case of this character, before the distension becomes too great, place the patient upon the back, with the head and knees somewhat elevated, and the thighs separated so that the fingers of the left hand can be placed upon the perineum. Seat yourself upon the right side, with the determination to pass a No. 4 silver catheter before

changing your position. I prefer a catheter of that size, because you can use more force with less danger of lacerating the urethra. Great patience is required to overcome the difficulty, and gentleness and caution are both especially important, for should the canal be lacerated it would be impossible to pass the instrument into the bladder. I have never failed but once, and if I had treated that case before the urethra was lacerated, I do not believe that I would have experienced much difficulty, although it was one of an exceedingly aggravated character. When the catheter fails, the bladder should be punctured through the rectum with the long curved trocar exhibited. Oil the forefinger of the left hand and pass it into the rectum, in order to ascertain the position of the prostate gland. The trocar should then be introduced by the side of the finger until the point rests upon the bladder, about an inch above the prostate gland; then by a sudden motion it is forced into the cavity. So soon as the trocar is removed the urine will escape through the canula, and instant relief is afforded. The canula should be allowed to remain, and can easily be retained by a T bandage until the urethra is sufficiently dilated to render its presence unnecessary. When I performed this operation, I would have felt humiliated, if the case had not been improperly treated before I made the effort to pass the catheter.

When a perineal fistula will not heal after the canal has been dilated, or when it is impossible to introduce an instrument into the bladder, Syme's operation should be performed. The patient being placed in the position required in the operation of lithotomy, a silver catheter should be passed to the point of obstruction, and the extremity of the instrument exposed by a free incision, which should extend an inch below, in the direction of the urethra. A grooved director should then be passed into the bladder, which will conduct or direct the catheter into the cavity, where it should be allowed to remain at least ten days, and when removed another should be introduced, and changed every three or four days until the external wound heals, when the case should be treated as one of ordinary stricture.

The most remarkable and unpromising case of this character I have ever treated, was published some years since in the *Charleston Medical Journal.* James Smith, a boy, aged sixteen years, was crushed at Tower Hill, California, by a bank of earth. The bones of the pelvis were fractured; both the urethra and bladder were ruptured, and the

urine escaped through fistulous openings in the groin and perineum. The patient having been abandoned as incurable, he was sent to the country in order to improve his general health, and when he returned in three months the operation was performed as directed. After exposing the catheter, the first effort made to pass the director was successful. The extremity of the catheter was then placed in the groove, and it glided readily into the bladder. The opening in the groin soon healed, and when his health was entirely restored he returned to Illinois, and is now in good health, and the father of a large family.

Should infiltration of urine occur from the improper use of instruments, the most serious consequences may be apprehended. The patient very soon exhibits evidences of the greatest possible distress, the pulse becomes feeble and rapid, the extremities cold, the respiration difficult, and delirium is not an unusual accompaniment. If the local irritation is not speedily relieved by free incisions, death will soon follow. The incisions or punctures should be as extensive as the infiltration, and after the urine has been pressed out, cloths wet with warm water, fomentations, or the warm-water dressing, should be applied. Give alcoholic stimulants freely, apply heat externally, and indeed employ every means within your control calculated to counteract the general prostration which invariably results from such a difficulty. If the urine cannot be removed, the parts exposed to its action soon become gangrenous, with the symptoms described in my lecture on the subject of the terminations of inflammation.

In stricture the best internal remedy is the iodide of potassium; it acts on the absorbents, and aids very materially the use of the bougie. It may be given alone, or in combination with the tinct. of belladonna and aconite, and if the bowels be constipated, the fluid ext. of senna should be added, ʒiij to a ℥vj mixture. I have already directed your attention to inflammation of the bladder as a consequence of gonorrhœa, and now I propose to detain you a short time in describing the symptoms and treatment of a disease, which I fear you will, when you arrive at my age, regard as one of the most obstinate, if not incurable, of human maladies.

Catarrh of the Bladder.—This results from inflammation, frequently of a gonorrhœal character, that has been neglected until the mucous membrane becomes thickened, indurated, and even ulcerated,

which accounts for the immense discharge of mucous and muco-purulent matter which the urine deposits. Four ounces frequently contain one of mucus, or of a mixture of pus and mucus, according to the stage and violence of the disease. The coats of the bladder not only become thickened and irregular, but the capacity of the organ is greatly diminished, which, combined with the irritability of the mucous membrane, renders it necessary to pass the urine very frequently, which is almost always exceedingly painful.

Various remedies have been recommended in such cases, and they occasionally prove successful. Dupuytren's favorite prescription was ol. terebinth. in ten-drop doses three times a day, with counterirritation over the hypogastric region, either with croton oil or tartar emetic ointment. In an exceedingly obstinate case in this city, I effected a cure by the use of croton oil as a counterirritant, and the administration of two capsules three times a day, composed of cubebs and copaiba. Benzoic acid has in some cases a very happy effect, particularly when combined with some preparation of opium. The following is the best combination of remedies which I have found in cases of this character:

℞.—Acid. Benzoic.,
Tinct. Belladonnæ, āā . . . . . ʒiij.
" Aconit. Rad., ... ʒj.
Spts. Vin. Rectif., ... ℥j.
Morph. Sulph., ... gr. iv.
Syr. Zingiberis, ... ℥iiss.
M. Sig. Take one teaspoonful every six hours.

The effect of the morphia is exceedingly pleasant when the desire to pass the urine is very frequent. The fluid ext. of buchu is almost always prescribed in this disease, and I suppose must possess properties which entitle it to the confidence of the profession, but I am compelled to say that I have never been able to satisfy myself that it really possesses the merits ascribed to it in cases of this character. In simple irritation of the bladder it may be useful, but in this disease it is not only inferior to the remedies enumerated, but also to uva ursi. This should be given in infusion, ℥j of the leaves being sufficient for a pint of boiling water, which should be taken every day. When one remedy loses its effect, another should be substituted, or a combination made according to the indications which the

case presents; and you will find that the beneficial effect of every remedy which has been prescribed in cases of this character is greatly increased by the use of some preparation of opium.

Remedies are sometimes applied to the mucous membrane of the bladder by introducing a silver catheter, to which a syringe is attached. The instrument exhibited is preferable to any other in consequence of its simplicity, and with it the fluid, after reaching the bladder, can very easily be prevented from escaping. The solution, whether it be of alum, nitrate of silver, sulphate or chloride of zinc, or any other astringent, should be carefully used. The injection should neither be too strong, nor allowed to remain long enough to produce either much pain or uneasiness. It may be repeated every alternate day. When blood follows even the introduction of a catheter, the solutions of iron are improper, as the coagulum might be too large to pass through the urethra, and serve as a nucleus for a urinary calculus. I have always been disappointed by the use of injections. I have tried them all, and now I seldom recommend them, except to amuse a patient until other remedies have time to act.

Counterirritation in some cases exerts a decidedly beneficial influence. A seton introduced either above the symphysis pubis or in the perineum, if the patient be confined to bed, has frequently a good effect, and sometimes the application either of croton oil or tartar emetic ointment affords great relief. To cure a bad case of vesical catarrh, a combination of the most active remedies is required, as well as temperance, and the exercise of great patience on the part of both patient and physician.

When the remedies fail, it has not only been suggested but practiced, particularly when the cystorrhœa is complicated with disease of the prostate gland, to make an opening into the bladder such as is necessary for the removal of stone, for the purpose of relieving the bladder of the necessity of expelling its contents, and for the benefit that may result from the hæmorrhage and suppuration inseparable from such an operation.

Prof. Parker, of New York, was the first to perform this operation, and although the patient died of disease of the kidneys and lungs, it afforded great relief. I have operated twice in this State within the last five years. The first operation was performed on the corner of Stockton and Geary Streets. The prostate was enlarged,

and the disease of the bladder was not even alleviated by the remedies usually prescribed. The operation was followed by profuse and repeated hæmorrhage, and the wound did not close until the twenty-seventh day. The patient left the city greatly improved, and has since entirely recovered. The other patient was from Oregon. He was examined by Drs. Morse, Burnett and Badarous, and no stone being detected, in consequence of the distressing character of the symptoms, and the relief afforded in the other case by an operation, I determined to pursue the same course. Instant relief was afforded, and the symptoms, which were previously so distressing, did not return until the wound had nearly closed. Then he had a chill, which was followed by a fever that continued until the cicatrix ulcerated, which relieved the bladder. The urine one year after the operation passed through the urethra, and could be retained about forty minutes, which was much longer than before, and its evacuation was much less painful. The only reward I received for the attention bestowed upon the case, was a demand of ten thousand dollars or a suit for malpractice. The money was never paid, nor was the suit instituted.

Professor Gross, in his work *On the Diseases of the Urinary Organs*, says that should a favorable case present, he would not hesitate to operate, and in a private letter addressed to me he expresses the belief that it will soon be recognized as a legitimate operation. I will certainly perform it whenever other remedies fail to afford relief, in defiance of the danger of suits for malpractice, which patients are often advised to bring by the less fortunate and unprincipled members of the profession. When this course is adopted, the wound should be prevented from healing for several weeks, by the occasional introduction of a female catheter or some other small metallic instrument.

Hæmaturia, or hæmorrhage from the mucous coat of the bladder, is not a very uncommon occurrence. It may result from the introduction of instruments, from violence, or from the laceration of the vessels from overdistension of the organ. When the blood is limited in quantity it will be readily expelled, but when the bladder is so much distended as to be unable to relieve itself, a large silver catheter should be introduced, and a syringe so adjusted that the blood can be drawn out through the catheter. Should the coagulum be firm, water should be thrown in and pumped out as often as may be necessary

to remove the difficulty. Fortunately, when the urethra is wounded, the blood rarely finds its way into the bladder. When it reaches the prostatic portion the sphincter contracts and excludes it entirely.

There yet remains a very important disease of these organs, to which I propose to devote the few minutes which remain of the time to which I am entitled before finishing this lecture, which is disease of the prostate gland. It is not uncommon, and when it occurs at an advanced age it is absolutely incurable, which is not, however, the case when the induration and enlargement result from gonorrhœa. It is then curable, although it yields with difficulty. After one or more attacks of inflammation of the neck of the bladder, from the sudden suppression of the discharge, some difficulty is usually experienced in passing the urine. If a bougie or catheter be introduced, it will pass readily until its extremity reaches the prostate gland, and the resistance is so decided that the hand must be depressed so as to elevate the extremity sufficiently to enter the bladder. Retention of urine rarely results from this form of the disease, consequently neither a bougie nor catheter should be employed in the treatment of such cases. They yield most readily to the internal use of the iodide of potassium and corrosive sublimate. Should the enlargement be considerable, counterirritants applied to the perineum are especially efficacious. A seton may be introduced, or the tincture of iodine applied, so as to keep up considerable irritation without rendering the patient unable to take active exercise. When this disease is the result of age, the gland is not only enlarged but also greatly indurated. The enlargement may become so great as to obstruct the urethra, so that it is impossible to pass an ordinary silver catheter without curving it greatly near the extremity, and then it often is necessary to pass the forefinger into the rectum to give it the proper direction. In aggravated cases, when the patient is not convenient to his physician, or when the gland is enormously enlarged, particularly the middle lobe, an opening should be made and established from the rectum to the bladder, which not only affords great and instant relief, but also enables the patient to dispense with the use of the catheter, which is always in such cases a source of pain and annoyance.

During the first year I practiced medicine, I was called to see a Mr. Williams, an old Revolutionary soldier, whose bladder was excessively distended from this cause. A catheter was introduced and secured, but in two or three days it escaped, and this was followed

by retention of urine. His residence being sixteen miles distant, I made an opening with a bistoury from the rectum, which was sufficiently large to become fistulous, and he lived five or six years, more comfortably than for many years before the operation was performed.

LECTURE XIX.

GENTLEMEN: This morning I propose to lecture on wounds and bruises or contusions.

A bruise is an injury caused by a blow, either with or without a solution of continuity. Contusions vary in degree, according to the amount of violence offered to the part injured. A slight contusion would result from striking your hand against that table, and if greater violence was offered, one of a much more serious character would result. After the receipt of such an injury the swelling corresponds with the violence and location. An extravasation of blood usually occurs, which is called ecchymosis. The part then becomes livid, and if the quantity effused is not so great as to render its artificial removal necessary, in a short time by the action of the absorbents it presents various shades of color; from dark it generally becomes green, then yellow, and ultimately the part presents no evidence of having been injured. When the upper part of the face becomes discolored by a blow, leeches are frequently applied with the expectation that they will remove the extravasated blood, but instead of obtaining that result the difficulty is always greatly aggravated. In consequence of which, I advise you never to apply leeches either to the face or temples, particularly in females, for besides the effect already described, they leave a scar or cicatrix which is more or less conspicuous according to the location. When the local abstraction of blood becomes necessary, it should be taken from a part which is not usually exposed. When the quantity effused is too great to be absorbed, the integument should be punctured with a lancet, and a tent introduced to prevent union by the first intention. In contusions of the face, cold water is preferable to any other local remedy, and when constantly applied the discoloration will generally disappear in a few days. When a more active remedy can be employed, the evaporating lotion will be found very useful, which is composed of one part of alcohol and ten of water. It evaporates rapidly, and the heat of the part is proportionably diminished. Aqua ammoniæ is frequently combined with water to produce the same effect, or in other words to prevent

the occurrence of inflammation in the part injured. Sulphuric ether is more volatile than ammonia, and may occasionally be found useful. Vinegar, diluted with an equal quantity of water and kept constantly applied, will be found sufficiently active in many cases. The best application I have ever made, either to relieve pain and prevent inflammation or to remove it after it has been developed, is composed of the following ingredients:

℞.—Plumb. Acetatis,	℥j.
Tinct. Opii,	ʒij.
" Arnicæ,	℥iv.
Aquæ Font.,	℥xxvi.
Misce.	

During the day three or four folds of porous cloth or lint saturated with the solution should be kept constantly applied, and at night it should be covered with oiled silk, to prevent evaporation and to avoid the disturbance that would result from the repeated changes which exposure would render necessary. When an anodyne is administered, and the mixture is applied at night as recommended, you will rarely fail to discover in the morning a decided improvement. Erichsen recommends the tincture of arnica, alone or combined with six parts of water. It would unquestionably have a good effect, but my own experience is that when combined with the other ingredients, the effect will be much more satisfactory.

In the treatment of such cases the patient must be kept free from pain, because the blood will flow in an increased quantity to a part so long as the pain continues. It being impossible to prevent it by any local treatment that can be adopted, you may give McMunn's elixir of opium, or any other preparation, either alone or in combination with Hoffman's anodyne.

℞.—Morph. Sulph.,	gr. j.
Sp. Eth. Co.,	ʒij.
Syr. Simplicis,	ʒvj.
M. Sig. Take one teaspoonful every hour until relieved.	

Sometimes a grain of old opium, or a fourth of a grain of the sulphate of morphia, may be given every hour or two until relief is obtained. The quantity of opium required to relieve pain depends upon its violence, the sex, constitution, and habits of the patient.

In one case the eighth of a grain of the sulphate of morphia will be sufficient, when in another one or two grains could be taken with impunity. When the stomach is irritable, it may be either thrown into the rectum or applied endermically or hypodermically with the same result. The only modification necessary is to administer by enema or apply to a denuded surface double the quantity proper to be taken into the stomach. The cuticle may be removed in a few minutes by the application of three or four doubles of paper wet with the strongest spirit of ammonia, and pressed firmly to the part so that the air may be entirely excluded. In less than five minutes the cuticle can be detached, and then from half a grain to a grain of the sulphate of morphia should be applied and retained with a small portion of wet printers' paper, which, when dry, adheres more firmly than adhesive plaster. When a considerable quantity of blood is effused, you should allow it to remain for a time, as it may be absorbed. Should the part, however, become red and painful, or in other words when the evidences of inflammation and suppuration are decided, then an opening should be made, the contents removed, and the case treated as an ordinary abscess. The wound made to empty the cavity would heal by the first intention if a tent were not introduced and retained for twenty-four hours, then it should be removed and the warm-water dressing or a poultice applied and continued until the discharge ceases.

Wounds are solutions of continuity on the surface of the body, produced by violence. Some authors describe four varieties,—incised, contused, punctured, and poisoned. The latter will be considered separately, and as the wound in such cases constitutes a very insignificant part of the difficulty, I think they do not properly belong to this class of injuries. I will therefore confine my remarks to incised, punctured, and contused wounds. The first are made by cutting instruments. If I were to draw the edge of a knife across the back of my hand, an incised wound would be the result, and it would be serious or otherwise in proportion to its depth. Should the skin only be divided it would be considered simple, but should it be sufficiently deep either to divide the tendons or to open a joint, it would then assume a very different character. In the treatment of incised wounds the first indication is to arrest the hæmorrhage. Never dress a wound of this character until you are certain that every artery has been ligated or that the bleeding is checked

by other means. Never trust to chance or pressure in such cases. By pursuing this course I have never had, during a long and extensive surgical practice, to remove the dressings but once. To arrest a hæmorrhage you should tie every vessel of sufficient magnitude to bleed, particularly if you desire to effect union by the first intention. The ligatures should be placed in the most dependent portion; they will not prevent union, except at the point they occupy. If a tumor be removed, never try to heal the entire wound by the first intention, because such efforts are always unsuccessful. If few ligatures have been applied, then a small portion of wet lint should be introduced to enable the bloody serum and purulent secretion to escape. You may, by pursuing this course, prevent pyæmia, which is the most dangerous complication that could occur after either the wound or surgical operation. When the hæmorrhage has been arrested, be careful to remove the coagulated blood from the surfaces to be approximated, for if it is allowed to remain union cannot take place by the first intention.

Wounds also differ in form, which depends both on their direction and the location of the part injured. When the fibres of a muscle are divided transversely, the space that intervenes between the extremities will be much greater than if the incision had been longitudinal, and they can with great difficulty be approximated; and should that be possible, union by the first intention will not occur, it being always ligamentous. Erichsen thinks that wounds may unite by five different processes. The first he calls immediate union, and he thinks it occurs when the edges of a wound, after the hæmorrhage is arrested, are approximated and unite without the deposition of plastic lymph. I cannot conceive of the possibility of two surfaces uniting without the intervention of lymph, and if it is possible, you will find that it is a very rare occurrence. When lymph constitutes the bond, union may take place in two or three days, or by what is called the second intention. When two granulating surfaces are placed and retained in contact, union will take place as readily as when the wound was inflicted. I have recently had a case in which an epithelioma of the lower lip was removed. The general health of the patient being greatly impaired by intermittent fever, at the expiration of five days, when the sutures were removed, union had not taken place. The wound was again closed by the interrupted silver suture, the paroxysms of fever were arrested by

the use of the sulphate of quinine, with a generous diet and a bottle of porter every day; in a week, union by the second intention had taken place, and was as perfect as if it had occurred as was anticipated. A wound may heal by granulation; when the granulations fill the wound, cicatrization occurs. Epithelial scales are deposited upon the surface of the granulations when they rise to a level with the surrounding integument. The skin is never reproduced, consequently a cicatrix never resembles it in any respect. It differs in color and appearance, it never produces hair, and it resembles the fibrous more than the cutaneous tissue.

The difference between incised and punctured wounds is that the latter are more extensive in depth than in width, and an incised wound is just the reverse. Punctured wounds are generally made by small sharp-pointed instruments, yet they may be produced by a nail, which, when sufficient force is applied, sometimes passes through the integument, and you then have both a punctured and lacerated wound, which is more dangerous than those produced by a cutting instrument, and require different treatment. When a punctured wound is simple, an effort should be made to heal it by the first intention; when deep, place a compress upon each side, apply the water-dressing, and secure it with a bandage sufficiently tight to bring the entire extent of the surfaces in contact, and allow it to remain until union has taken place. Should a punctured wound be followed by hæmorrhage which cannot be controlled by pressure, it should be enlarged and the vessel ligated, unless it be one of the vessels of the forearm near the elbow-joint, and then I think it would be better to apply a ligature upon the brachial artery. Ten or twelve years ago a gentleman of this city came to my office after having suffered from repeated attacks of hæmorrhage, which resulted from a punctured wound made by a sword-cane that was passed through the upper part of the forearm anterior to the bones. The wounds were small and painful, and being greatly exhausted by the loss of blood he was placed upon a sofa, and the brachial artery ligated, because he had no more blood to spare, and it was impossible to determine the location of the wounded vessel. The hæmorrhage did not return, and the patient was well in fifteen or twenty days. Whenever one of the arteries near the wrist is wounded, it is always better to enlarge the wound and apply a ligature both above and below the puncture. Should inflammation

occur after such an injury, it should be treated as an ordinary contusion, and when suppuration takes place an incision should be made and the water-dressing applied. Should a wound be both punctured and lacerated or contused, never allow it to heal by the first intention. It should be enlarged if made by a nail, particularly if upon the hands or feet, and filled with lint saturated with ol. terebinthinæ, which should be allowed to remain until suppuration is established; and then the treatment is the same as that of an ordinary ulcer. I have known, both here and elsewhere, persons to die of tetanus in consequence of a different course being pursued.

When tetanus does follow such an injury, you should divide the nerve above the wound if possible. Should it be upon the foot or hand, make a crucial incision and apply the actual cautery so effectually as to cut off all communication with the brain. A few years ago I published two cases of traumatic tetanus cured by a surgical operation. In one the boy was saved by amputating the little toe, and in the other by making a transverse incision above the wound down to the radius. The wounds were not allowed to heal, and a grain of sulphate of morphia was applied morning and evening, and twenty drops of the tincture of cannabis indica was given every two hours until the symptoms entirely disappeared.

I have now under treatment a man from Solano County, who had tetanus which resulted from a superficial gunshot wound on the right side of the abdomen. One grain of the sulphate of morphia was applied every six hours, and twenty drops of the tincture of cannabis indica was given every two hours, both day and night. He improved so rapidly under this treatment, that the wound was not removed as I intended, and the disease in two weeks was entirely relieved, except a slight stiffness or contraction of the muscles of the lower jaw. The symptoms in such cases, if the disease is fully developed, do not disappear so soon as the operation is performed, but subside gradually.

Contused wounds, as well as the other varieties, vary both in extent and degree. The contusion may be slight and the wound very limited, or it may be violent and the solution of continuity extensive, and consequently very serious. It is generally believed that contused wounds will not heal by the first intention. I have treated two gunshot wounds in this city, in which a pistol-ball passed through

the anterior and muscular part of the thigh, which healed in less than a week so completely that both the patients were able to attend to business, although one of them was brought from San Mateo in a carriage after the wound was inflicted. The only remedy employed was cold-water dressing, and the same result was obtained in both cases. These cases are exceptions to the general rule, and such a course, unless in the same or some other equally favorable location, is not desirable. You will frequently meet with patients who suffer greatly from contused wounds of the scalp, because they have been improperly treated, either by the interrupted suture, or by the application of adhesive plaster. In such cases, after the blood has been removed, wet lint should be placed between the edges of the wound, and the water-dressing applied, which treatment should be continued until the cavity is filled by granulations, and then simple cerate should be substituted.

Contused wounds are always disposed to inflame, and should the inflammation be so violent as to resist the action of the remedies employed, it may terminate in mortification. Cold irrigation is superior to any other treatment that can be adopted, and the mode of application depends on the violence of the injury. You may apply lint, wet with cold water, constantly to the part, or suspend a pitcher or any other conveniently shaped vessel, with candle wicking so arranged as to act as a siphon and convey the water drop by drop where it is required. The part upon which the water falls should be covered either by lint or by three or four folds of porous cloth, so as to protect the skin from its direct action. The quantity of water conveyed to the part inflamed should depend upon the extent and violence of the inflammation, and can be increased or diminished by changing the size of the siphon.

I have already referred to the extraordinary effect of irrigation in a case in which about half of the foot, with most of the muscles and tendons of the leg, were torn away by the hawser of the Oakland ferry-boat, and which are contained in this jar. That man was able to walk in six weeks almost as well as before the accident occurred. By the influence of this treatment, at the expiration of nine days, every indication of inflammation having disappeared, the warm-water dressing was applied, and so soon as suppuration was established the spiculæ of bone were removed, and the wound speedily cicatrized.

I repeat, apply cold water until the danger of inflammation has

passed, and then the warm-water dressing or poultices to hasten the granulation and cicatrization of the wound. When contused wounds are followed by excessive inflammation it frequently becomes necessary to resort to constitutional treatment. Formerly bloodletting was prescribed, it being the most powerful antiphlogistic agent known to the profession, but since physicians have become familiar with the properties of veratrum viride, aconite, and other depressants, it is rarely necessary to resort to venesection. The most powerful combination of depressants I have ever employed was given in my lecture on the treatment of inflammation. One teaspoonful of that mixture, given every two hours, will, in six or eight hours, control the most violent arterial action, and when that is controlled the respiration and temperature become normal, the secretions are restored, and consequently the necessity for venesection is removed. The bowels should be kept free either by the use of laxatives or by the occasional administration of an enema. During the continuance of inflammation the diet should be low, and consist of arrowroot, water-gruel, toast, or rice-water, and as the symptoms improve the patient should return gradually to his ordinary diet.

Gunshot wounds are of a mixed character, being usually both punctured and contused. When an ordinary ball passes through a part it produces a small punctured wound, and the adjacent parts are violently contused. There is a great difference in size between the wounds made by the entrance and escape of the ball, the former being always much smaller and less irregular, although that depends somewhat on the velocity. If a gun is well charged and placed near the part the ball will pass through with great velocity, and the difference in the size of the wounds will be much less than if the object were at a greater distance. Consequently the velocity of a ball can generally be determined by the difference in the size of the wounds.

Gunshot wounds always excite great alarm, and produce more constitutional disturbance than any other injury. Even if the wound be very slight, a mere superficial abrasion, it usually is so depressing that the skin becomes pale and cold, the breathing difficult, and the pulse small and frequent. In such a case you must encourage the patient by speaking kindly and cheerfully, and administer stimulants to promote reaction, which will soon occur if the injury is slight; but should an extremity be torn off or shattered by a cannon-ball, the prostration would be so great that reaction would take

place, if at all, very slowly, and the patient would perish from the nervous shock, inseparable from such an injury. Should an extremity be torn away by a cannon-ball, the skin is always shorter than the muscles, is above the exposed surface, and the bone and muscles project, and the latter present a red and ragged appearance.

It is not necessary that firearms should contain a ball to inflict a serious wound. It may result either from powder alone, from a wad of tow or paper, a splinter of wood, or any solid substance. It is more important to know how to treat a gunshot wound than to ascertain how it was produced. The inflammation which follows a wound of this character either terminates in mortification, or suppuration is soon established. The edges frequently slough, although this does not necessarily occur. All foreign bodies should, if possible, be removed, and the surfaces placed as nearly in contact as possible, and then cold applications made, as already recommended, to limit the extent and moderate the violence of the inflammation. When that has subsided, or the period for its development has passed, warm applications should be made for the purpose of hastening both the separation of the slough and the production of healthy granulations, so that the opposing surfaces of the wound may be approximated and retained in contact until union takes place.

LECTURE XX.

GENTLEMEN: My last lecture was upon wounds and contusions. I then told you that the former include incised, punctured, and contused or lacerated wounds, and also endeavored to describe gunshot wounds, which is rather difficult, as they may result from powder, from a wad either of tow or paper, from small shot, buckshot, a minié or common ball, a portion of an exploded shell, a splinter of wood, or any solid substance which can be thrown with sufficient force by powder to produce a contused or lacerated wound. In every case of this character the first indication in the local treatment is to extract the ball or other foreign substance if possible. Various instruments are used for that purpose. The ordinary dressing forceps is in many cases as convenient as any instrument that can be employed. The bullet forceps which I exhibit are generally used in deep narrow wounds, there being a cavity in the extremity of each blade which renders them superior to the dressing forceps, particularly if the ball be round and smooth. The best instrument for this purpose is the one which I now exhibit. When the position of the ball is ascertained, it can be secured by the screw on the extremity of the instrument and removed as you would draw a cork from a bottle. Even with such instruments at your command, you will find it exceedingly difficult in deep and narrow wounds to remove either a ball or any other foreign substance. After two or three unsuccessful efforts have been made, it is better not to distress the patient, but to leave it in the wound either to be thrown off by suppuration or to become encysted, when it will no longer prove a source of irritation. I treated a case in the County Hospital thirteen years ago, in which the contents of a large duck-gun were received in the upper and external portion of the thigh. The shot were so numerous that I determined to allow them to remain until suppuration took place, and then be governed by circumstances. In two or three weeks the shot were all removed without pain, nor was the convalescence of the patient retarded. Should the wound, however, be large, and if the foreign substance can be exposed and removed without

difficulty, it should not be neglected. Should hæmorrhage follow an operation of this character, it should be arrested and the wound then treated as already indicated. In such cases you can neither apply evaporating nor anodyne lotions, because there is a solution of continuity; such remedies are not only painful, but if long continued will produce inflammation of the wound. The best possible application is cold water; if the wound be slight, four or five layers of porous cloth or lint kept constantly wet is all that is required. In more serious cases, where violent inflammation and extensive sloughing is dreaded, cold irrigation should be preferred, and by its faithful employment I believe that you can often save not only an extremity but also a valuable life, when by other treatment they would be sacrificed. I shall always recollect the case of a distinguished lawyer of this city, who jumped from a buggy when in rapid motion, and struck upon the outer side of the right foot. He dislocated the ankle-joint, and the lower extremity of the fibula protruded through a wound three inches in length. After the reduction of the dislocation, the limb was placed upon Roe's splint, which had been previously well padded with cotton. It was kept wet constantly for ten days, and then the warm-water dressing was substituted, and in forty-six days he was able to visit a neighboring city to attend to an important case in which he was interested, before the Supreme Court of this State. Cases resulting from gunshot wounds, as well as other injuries, occasionally occur in which it is impossible to save the limb by any course of treatment that can be adopted. Suppose that an arm or leg should be shattered by a spent cannon-ball or by the falling of a heavy weight, by which both the bones and the bloodvessels are injured, and the patient exposed to the danger of secondary hæmorrhage, then it would be unsafe to make the effort.

Should the capsular ligament of the knee be injured, the bones fractured, and the artery wounded, then you should not hesitate to amputate the limb. Very frequently when the ankle-joint is exposed, the patient, as you have already been told, may recover, and the members of the class who have attended my clinical lectures have had an opportunity to know the treatment which I prefer in gunshot wounds of the hand. It so happened that two unfortunate young men were admitted in almost the same condition. In both cases the thumb and little finger were all that remained, and instead of amputating at the wrist they were saved in both cases. You should always remove the

shattered bones, the lacerated tendons, nerves, and muscles, and endeavor to save integument enough to cover and protect the parts that are preserved. When an extremity is crushed, or, in other words, when all the bones, nerves, and tendons are mangled, as occurred some years ago in the case of a boy twelve years old, whose hand was caught by the beater of a cotton mill and torn in pieces, I did not hesitate to remove it, although the operation was performed with a shoemaker's knife and a tenon saw. I never performed one that resulted so favorably. The wound healed entirely by the first intention, and the boy in less than a week was able to resume his position.

Some difference of opinion exists in reference to the time at which amputation should be performed. After a severe shock there is always great prostration, which continues from one to six hours, according to the extent and violence of the injury. When reaction does not take place within the time specified, there is great danger that it will not occur; the injury may be so serious that it is impossible for the system to react, and hence, if at the expiration of six hours the temperature of the body is not restored, the pulse has not become full and strong, and the mental faculties are still impaired, you should apprehend the most serious consequences. When reaction does occur, twenty-four hours generally elapse before any decidedly unfavorable symptoms appear, and inflammation is then usually developed, which may be so violent as to terminate in gangrene, but if controlled suppuration will soon be established, accompanied with fever, which generally continues until the patient recovers or dies from exhaustion.

You will frequently, both in gunshot wounds and other serious injuries, find that the case will progress favorably for some time after suppuration is established, and then the patient is attacked suddenly with diarrhœa, his appetite is impaired, the strength rapidly diminishes, and unless the cause is removed a fatal result is inevitable. In such cases amputate, and then give tonics and stimulants with as much simple nutritious food as can be digested, and the result will almost always be favorable. Patients recover more speedily and certainly from amputations after they have become inured to pain and an exhausting purulent discharge, than if they had been operated on at an earlier period, except within a few hours after the receipt of the injury. I would therefore advise you

always to operate during the second or fourth stages. Never amputate during the stage of depression nor during the existence of acute inflammation. The best time is so soon as reaction occurs, and should circumstances render this impossible, then it should be deferred until suppuration is fully established. Be careful to subject the patient to as little pain as possible; take every precaution to prevent excessive hæmorrhage, and you will succeed even under very unfavorable circumstances. I have been practicing surgery for thirty years, and yet I have neither lost a patient on the table nor within five days after the operation was performed. You often hear of patients dying either on the table or within a few hours after they have been removed. I think that in such cases there has been bad management. They have inhaled too much chloroform, have lost too much blood, or were not in a condition to submit to such an operation. When I dread the consequences from the loss of blood in an operation, I supply three or four young men with spring forceps enough to seize all the large vessels and secure them until ligatures can be applied. When this course is pursued there is no necessity for the loss of much blood, even in the most extensive operation. During the inflammatory stage the patient should be kept quiet, and the best means, both general and local, employed to limit its extent and diminish its violence. No operation should be performed during that period, as it would be exceedingly dangerous. I repeat, that the consequences that may result from the inflammation that must follow every serious injury, should be ascertained before an operation is either recommended or performed.

When mortification follows either a gunshot wound or any other serious injury, always wait until you are certain that the difficulty is arrested, which can only be positively determined when the line of demarcation is distinct and decided, and then the operation will not have to be repeated. In the case operated upon in the hospital for popliteal aneurism, in consequence of the condition of the patient, gangrene of the limb occurred eight days after the femoral artery was ligated. The parts below the ligature were not alone implicated, but mortification extended to the hip-joint, and if amputation of the thigh had been performed, it would have failed to save the patient. It is therefore always better to wait until the line of demarcation is distinct, because if you operate before that occurs the stump may become gangrenous, and you should always allow

a patient to die from the consequences of the injury rather than for the result to be attributed to the interference of the surgeon. In such cases always advise with one or two medical friends, as a young physician cannot be too careful of his reputation.

Heat and Cold.—It is exceedingly important to be familiar with the effect of excessive cold and heat upon the human body. Cold diminishes the vitality, and if frequently repeated or too long continued, produces inflammation of the part exposed, which is generally confined to the skin covering the extremities, and is called chilblains. Delicate persons are more liable to this disease than the robust and vigorous, and in such constitutions it is not necessary that the exposure be long continued or very intense. You will meet with many persons in this city with chilblains, although the weather is seldom cold. The part becomes red and swollen, and itches or burns excessively. The feet are more liable to the disease, although the fingers suffer occasionally. At one time I showered my feet at night to remove the heat and soreness resulting from close attention to business, and in about two weeks I had chilblains so severely that the cold water had to be abandoned. The feet were then showered with warm water until the skin became very red, and after being dried perfectly with a coarse towel, were kept warm during the night by the application of a heated brick or a bottle filled with hot water, which very soon removed the difficulty.

Chilblains require different treatment from that pursued in other forms of inflammation; besides the remedy already mentioned, apply camphorated oil, ol. terebinthinæ, equal parts of spts. vin. rectif. and tinct. arnicæ, or the tinct. of iodine and arnica. In cold climates this condition is exceedingly common, very annoying, and difficult to cure, but in California the course of treatment indicated will generally soon afford relief. When the cold is more intense the vitality of the part is destroyed, and it is said to be frostbitten. If any portion of the human body be exposed for half an hour, when the thermometer is ten or fifteen degrees below zero, it will freeze. I recollect that when I was a student in Kentucky, I walked about half a mile on such a night, and found when I reached home that the ear which had been exposed to the north wind was frozen. For a short time after leaving the college the ear was quite painful, but very soon the sensibility was destroyed, and I became aware of the fact only by the sense of touch. Snow was applied and

retained by the hand until it melted, then a cloth wet with cold water was substituted, and continued until the sensibility was restored. By pursuing that course, or, in other words, by thawing the part gradually, the inflammation will be much less violent. Intense cold has the effect to darken the skin much more rapidly than heat. A few years since, a party of gentlemen of this city returned from Salt Lake, in winter, and when they reached San Francisco, although they were well protected, the skin on the face was darker than that of a mulatto, but subsequently the cuticle was detached and the natural color restored. The treatment already given is that which experience has proved most successful. After the rigidity of the part has been removed, cotton batting should be applied, and secured until inflammation supervenes. When the part has not been exposed too long and has been properly treated, the swelling is not usually very great, and in a few days the cuticle is detached, and the part restored to a healthy condition.

In cold climates many die from exposure, but more lose a portion of the extremities. If heat be applied so soon as the difficulty is discovered, and reaction takes place at all, sufficient inflammation will follow to destroy the vitality of the part. The boy upon whom I performed Pirogoff's operation on both feet, was rendered a cripple in both his hands and feet by exposure in the mountains of California. The sensibility of the feet was so much diminished that he refused to take chloroform, and suffered but little from either operation. Should mortification result from this cause, you should wait not only until the line of demarcation is distinct, but also until the separation of the dead from the living tissues is complete, and then the bones can easily be divided. The wound should be treated as one resulting from any other cause.

Burns.—When a part is exposed to a high degree of temperature the action is increased. It becomes red in consequence of the distension of the vessels, and if the heat be sufficient to derange the ordinary and healthy action it is called a burn. These may be divided into three varieties, or rather there are three degrees of diseased action resulting from the application of heat.

The first is indicated by increased redness of the skin, accompanied with pain. The danger to be apprehended from a burn does not depend upon its degree but upon its extent. A mere redness of an extensive surface produces more constitutional disturbance and is

more dangerous than a much deeper lesion that is not extensive. When I was in the Hôtel Dieu in Paris one of the nurses in the hospital died, in consequence of taking a bath so hot as to scald or redden the skin, but not sufficiently so to produce the slightest vesication. Whenever you are required to treat a burn, let it be ever so slight, if extensive you should always be careful in making a prognosis. Extensive burns are almost always fatal. They destroy the function of the skin, fever from irritation, accompanied with diarrhœa, soon appears and continues until it proves fatal. As I have already remarked, in a burn of the first degree there is merely a redness of the skin, but when a part is either subjected to greater heat or kept longer under its influence the skin not only becomes red, but serum is secreted, which detaches the cuticle and produces what is called vesication, and a burn of the second degree, which, like the first variety described, is dangerous in proportion to its extent.

In a burn of the third degree, the true skin is destroyed with or without the subjacent parts. Sometimes not only the skin, but the tendons, muscles, and even the bones are destroyed.

I recollect two cases which were produced in the same manner that were treated in the Hôtel Dieu. The patients were both females about sixteen years old, and in consequence of some disappointment attempted to commit suicide by inhaling carbonic acid gas generated by burning charcoal. When rendered insensible, and during the struggle inseparable from such a condition, the anterior portion of the right leg came in contact with the grate which contained the burning charcoal. Although they both failed to destroy life, they succeeded in destroying the parts which covered the tibia about two-thirds of its length, and the periosteum of more than half of the thickness of that bone. When I left Paris they were both in good health and very cheerful and comfortable, and although a year had elapsed, there was no evidence that the dead bone would be speedily detached, which was indispensable before the wounds could cicatrize.

When a burn is produced by either hot or boiling liquid it is called a scald, which produces the same effect as dry heat, and the same extent of injury may result from the application. There may be an unnatural redness of the skin, vesication, and an entire destruction of the tissues, and this requires the same treatment.

Treatment.—When a burn is slight and not too extensive, the best remedy is to hold the part as near a fire as possible, and retain it in that position, however painful, at least half an hour; by the expiration of that time the redness will have entirely disappeared. Even when the skin is so much burned as to vesicate, if heat is properly applied, the same salutary influence may be expected. Some years ago the child of a personal friend ran into his bedroom at night with the posterior portion of her dress in a blaze; he caught the burning clothes in his hand and directed his wife to extinguish the flames by the application of water. The child was not injured, but both of his hands were extensively vesicated. Being very much engaged in business I directed him to hold his hands in front of the grate and as near as possible until the blisters disappeared, regardless of the pain that might result. The next morning the hands were neither vesicated nor painful; the cuticle was gradually detached without giving the patient the slightest inconvenience. There is no doubt that when patients will bear the pain, even in burns of the second degree, the proper application of heat will cause an absorption of the serum, the skin will not inflame, and the detached cuticle will remain and protect it until another is produced. The heat enables the vessels to relieve themselves of the unnatural quantity of blood invited there by the irritation. The same course of treatment is equally beneficial in the obstinate ulceration of the hands so common in California, two or three applications being usually sufficient. When a burn is both severe and extensive, and particularly when the treatment proposed is rejected, other means should be adopted. It is universally acknowledged that the best local application is a mixture composed of equal parts of ol. olivæ and aqua calcis. They form a whitish semifluid compound which may be applied either with a feather or a camel's-hair pencil so as to cover the entire surface. It not only allays irritation but also protects the part from the action of the atmosphere. Cotton batting should then be applied and secured by a roller bandage. The dressing should not be removed for three or four days unless it has been accidentally disturbed, and then it can be changed without the slightest difficulty, in consequence of suppuration being established. When the first dressing is removed, if the surface be found dry, inflamed, and painful, I have found a slippery elm or flaxseed poultice, made thin and covered with oiled silk, an exceed-

ingly useful application. The warm-water dressing, when the burn is extensive, is much more convenient and less distressing by its weight, and should be preferred. This treatment should be continued until suppuration is established and the pain has entirely disappeared. To hasten the cicatrization of such a wound I have found an ointment composed of creta prep. ʒij to ℥j of hog's lard superior to any other application. The subnitrate of bismuth in the same proportions will, in some cases, be found exceedingly useful.

Besides the local remedies recommended, you will find it necessary to prescribe constitutional treatment during the inflammatory stage, and so long as the febrile symptoms continue, depressants should be administered to diminish arterial action, accompanied with an antiphlogistic regimen and laxatives if necessary. When suppuration is established, if the secretion be profuse, then stimulants and tonics, with a generous diet, should be substituted. To adults give quiniæ sulph. two grains, four times a day, with either brandy or good port or sherry wine, according to the condition and previous habits of the patient.

For women or children the best stimulant is California port wine. They take it willingly because it is pleasant to the taste, and I have found it, from extensive experience in cases of this character, as well as in typhoid and scarlet fevers, after the acute stage has passed, one of the most valuable stimulants that can be administered. Without opium to relieve pain and produce sleep, no case can be treated properly. It should be given every night in a sufficient quantity to produce that effect.

LECTURE XXI.

GENTLEMEN: This morning I propose to say a few words about poisons. These are substances which destroy the structure or derange the action of the body, independently of mechanical violence or increase of temperature. Those which destroy the structure, are mineral acids, corrosive sublimate, nitrate of silver, and caustic potash. The latter, when applied to the skin, will destroy it in one or two hours. Although its action is prompt and powerful, you will sometimes find it exceedingly valuable in the practice of surgery. Suppose you should find it necessary to open an abscess of the liver, and no positive evidence existed that adhesion had taken place between the diseased organ and the abdominal parietes, then the caustic potash is invaluable, as by its use adhesive inflammation can be produced, and a sufficient opening made to allow the matter to escape; otherwise, the contents of the abscess would pass into the cavity of the peritoneum and prove fatal. In such cases, apply one grain over the most prominent part of the tumor, cover it with adhesive plaster, and in two or three hours after it ceases to be painful, raise with a tenaculum the insensible and discolored portion of the integument, and remove it with a scalpel. One grain will destroy the skin and subcutaneous cellular tissue. Two grains should then be placed and confined in the cavity produced by the first application, which will be sufficient to extend to the peritoneum, and cause that membrane to unite with the portion covering the external surface of the tumor. In three or four days, if the contents do not escape, a trocar or bistoury should be introduced. Some months since, I was requested to see a patient who had been spending some time in the tropics, and was suffering from great enlargement of the epigastric region. Although the symptoms were very unpromising, I determined to apply the caustic, as described, and in two days after the second application a bistoury was introduced, and an immense quantity of matter liberated. Although temporarily relieved, his pulse continued to beat as rapidly as before, and he died from exhaustion in about three weeks. It was ascertained by a post-mortem

examination that the abscess communicated both with the stomach and pericardium, which accounted for the excessive frequency of the pulse and the obstinacy of the other symptoms. When a mineral acid is applied either to the skin or mucous membrane, if not speedily removed or neutralized, the vitality will soon be destroyed; and this is more or less serious in proportion to the extent and locality. Several children have died in this city by drinking sulphuric acid by mistake for soda water. In such cases there is usually an entire destruction of the mucous membrane, which, if not speedily fatal, must be followed by stricture of the œsophagus, which sooner or later destroys the patient. In such cases, a solution of the supercarbonate of soda, or subcarbonate of potash, should be administered as soon as possible, and continued until the acid is neutralized; then the case should be treated according to the symptoms. Should a sufficient quantity of corrosive sublimate be taken into the stomach to destroy life, an emetic of sulphate of zinc, ʒj dissolved in half a tumbler of water, should be administered, and repeated every fifteen minutes until vomiting is produced. The action of the emetic can be rendered more prompt either by passing a feather into the pharynx, or by tickling the uvula and posterior portion of the fauces with the finger. Some years since, I was called late at night to see a woman who had taken an ounce of laudanum. Not having a stomach-pump at my residence, I went prepared with an emetic, but finding it impossible to induce her to take it, and the jaw teeth on one side being absent, I passed the forefinger into the mouth until the extremity rested upon the uvula, and kept it in that position until the contents of the stomach were expelled. When an emetic will not act, and a stomach-pump can be obtained, the contents of that organ should be diluted with warm water and removed as speedily as possible, and then the stomach should be filled with mucilaginous or demulcent solutions. The white or albuminous part of eggs, combined with water, should be preferred, but if they cannot be obtained, a solution of gum arabic or flaxseed may be substituted.

Although great injury has resulted from the improper use of nitrate of silver, yet we are rarely required to treat a case of poisoning resulting from this cause; yet, if such a case should occur, a solution of common salt is the best antidote that can be administered. To limit the action of the nitrate of silver, when applied

to granulated lids, a weak solution of common salt is superior to any application that can be made.

The use of the different articles enumerated in the treatment of surgical diseases will be specified when they are under consideration.

The poisons that more particularly interest the profession are derived from these sources:

1st. From the animal kingdom, by which they are produced.

2d. From disease.

3d. From changes that occur after death.

Of the animal poisons, we will first consider those secreted by insects and serpents, such as the bee, wasp, spider, and tarantula, as well as some of the varieties of the snake. I have never known any very serious consequence to result either from the sting of a bee, wasp, or hornet, or from the bite of a spider. The former are followed by excessive pain, and sometimes by great sickness and prostration for a few hours, and then disappear, even without treatment. The bite of a tarantula is said to be exceedingly dangerous. They are numerous in Mexico, but fortunately they are met with so seldom in California that they do not constitute a source of apprehension. In every country, except that claimed by my ancestors, Old Ireland, poisonous serpents are found, but the poison produced by the rattlesnake is the most destructive to human life. It is, therefore, exceedingly important to know how to treat such cases, as no time is afforded for preparation. The first indication is to prevent the absorption of the poison by placing a bandage above the wound, or between it and the heart, sufficiently tight not only to check the circulation but also to cut off all communication between it and the heart. The wound should then be enlarged, so that the poison may be removed either by suction, by the application of cupping-glasses, or by any other small hollow vessel that may be convenient; and then the actual cautery should be applied. If this course of treatment is promptly employed, the danger may be averted. Should the poison be absorbed, in consequence of proper assistance not being rendered, then you will have both local and constitutional symptoms to contend against. Formerly aqua ammoniæ, when used both locally and generally, was considered a specific. I am satisfied that when given in teaspoonful doses, properly diluted, and repeated every twenty or thirty minutes, according to the

urgency of the symptoms, and applied constantly to the wound, it is a remedy that deserves great confidence.

Alcoholic stimulants, such as whisky, brandy, and gin, when administered freely, are less unpleasant to a large majority of patients, and equally efficacious, very soon after the bite has been received; if it has not been treated actively the part becomes painful and swollen, which very soon involves the entire extremity, and sometimes the entire body. So soon as the poison enters the circulation the constitutional depression becomes manifest. The pulse is small, the face is pale, and the extremities are cold. The breathing soon becomes difficult, and death speedily follows if relief is not afforded. I have given a quart of whisky in two hours without the slightest symptom of intoxication being produced. Give stimulants to support the strength and counteract the effect of the poison until it is eliminated. If you can prevent the patient from sinking for a few hours, but little danger should be apprehended. Olive oil is also a powerful antidote, and should be given alternately with brandy, and continued until rendered unneccessary by the disappearance of the constitutional symptoms. An eminent physician of Alabama some years ago published the result of his experience, and it was certainly very extensive and exceedingly useful to the inhabitants of the entire Southern country, in the newly settled portion of which rattlesnakes were so numerous that such cases were of almost daily occurrence. He advised every person to keep themselves supplied with sweet oil and spirits of turpentine. The latter to be applied to the wound and the former to be taken in wineglassful doses every ten or fifteen minutes until three or four doses were taken, and then the quantity to be diminished and the intervals increased as the violence of the symptoms subsided. When great prostration existed he advised the use of aquæ ammoniæ, as already directed. He claimed that this treatment was infallible, and there is no doubt but it deserved the high opinion entertained of its efficacy by Dr. Hilary Herbert, who was the author of the article to which I referred.

The next class of animal poisons is that which results from disease, as in hydrophobia. In this State physicians feel less interest in this subject than they do elsewhere, because the disease has not yet been seen, and I hope never will appear, on this coast. You are, however, all young, and may live where hydrophobia occurs; it therefore

becomes necessary that you should be familiar with the course of treatment usually pursued. I have often travelled at night, when making professional visits, with a cane in one hand and a revolver in the other, and, on one occasion, even with such weapons, a horse-rack saved me from a large, powerful dog, which destroyed a great deal of property before he could be killed in the morning. The bite of a mad dog is of course very dangerous. The disease which results from the wound is called hydrophobia in consequence of the constant and dreadful fear of water exhibited by its victims. A rabid dog scarcely ever turns to the right or left, but snaps at everything that is within his reach, which accounts for the occurrence of the disease in the human subject so seldom, considering the number of dogs that die from that cause every year in the Southern States. Whenever a wound is inflicted by a rabid animal, every portion of it should be removed with a knife and the actual cautery applied, and then dressed as if it had resulted from any other cause. Medicine has no control over the disease, yet if I had a patient suffering from hydrophobia I would keep him under the influence of an anæsthetic, so as to render him insensible and remove the dread of the inevitable consequences of such a condition. Mercury, many years ago, was considered a specific, but subsequent experience has proved that it does not exert the slightest curative influence. In such cases narcotics and anæsthetics should both be prescribed, the former endermically and the latter when the patient has been secured in such a manner that resistance is impossible. Hydrophobia may be prevented by prompt and energetic treatment, but not cured, after the symptoms of the disease have become manifest. You will often be consulted respecting the necessity of having a biting dog killed, because it is generally believed that if he should at a future time become rabid, the person who had been bitten would suffer from the same disease. Nothing is more ridiculous, although it is universally believed. In California you can assure the public that it is not necessary, as hydrophobia is unknown in that State. Before dismissing this subject, I beg leave to recommend in all lacerated wounds produced by the teeth either of men, dogs, or other animals, when recent, to apply the remedy first used and recommended by Dr. Thomas Wells, of Columbia, South Carolina, which he assured me always prevented any unusual difficulty in the treatment of such cases, and which I have, from long experience, found to be the only

application that will deprive such wounds of any peculiarity resulting from their cause, and places them in a condition to heal as readily as those produced by any other injury. If lint wet with equal parts of the ordinary aqua ammoniæ and the tincture of opium be applied, so soon as they have occurred, twice a day, and continued three or four days, the wounds will not inflame, and can then be easily treated on common principles. Some of the most troublesome cases I have ever treated have resulted from wounds inflicted by the teeth both of men and the lower animals, and this treatment should not be forgotten, because it may save you much trouble and relieve you of great responsibility.

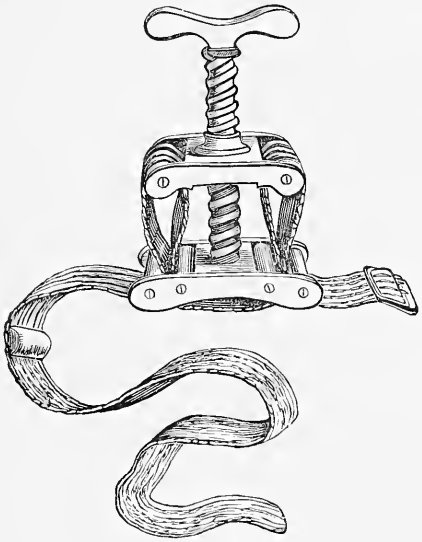
The poison produced by decaying animal matter often produces a difficulty of a serious character, and one in which you should all feel interested. Should even a slight wound be received, either in making a post-mortem examination or in the dissecting-room, particularly if the general health is not good, which is often the case with diligent students near the close of the session, in a few days the wound will sometimes become painful, the lymphatic vessels of the arm inflame, become indurated, and the diseased action may extend until the constitutional disturbance is sufficiently great to prove fatal. Punctured wounds of this character should be enlarged, and the nitrate of silver applied to prevent the absorption of the poison. Should a red line appear and extend from the seat of the injury towards the axilla, tincture of iodine should be applied as soon as possible and continued two or three times a day until the part becomes insensible to its action. When the pain is violent, either opium or some of its preparations should be given, and repeated as often as may be necessary to afford relief. The opium may be combined with either calomel, depressants, or both, according to the stage of the disease and the condition of the patient. So soon as typhoid symptoms appear, give a tablespoonful of the liquor ammoniæ acetatis, every three hours, with wine whey and as much simple nutritious food as the stomach can digest.

During the treatment of such a case, the bowels should be kept regular, either by the occasional use of ten grains of the extractum juglandis at night, or an enema, as may be indicated by the strength and general condition of the patient. As it is always better and often easier to prevent than to cure a disease, I would advise that instead of wearing gloves or applying glycerin to the hands when in the dissecting-room, which interferes more or less with the

use of the knife, you should endeavor to acquire the power to use the knife dexterously, and thus avoid a casualty of that character.

Amputations.—The term amputation is sometimes applied to the excision of the breast, although it is generally confined to the removal of the extremities. The surgeon is not only interested in removing the part, but also in removing it in such a manner that what remains will be left in a useful and healthy condition. The ancients were ignorant of the use of the ligature in arresting hæmorrhage, which is not surprising, since it was not until the seventeenth century that the discovery of the circulation of the blood was made by Harvey. The skin, muscles, and bone were then all cut to the same length, and an effort made to check the hæmorrhage by the actual cautery. Under such treatment secondary hæmorrhage must have frequently occurred. The actual cautery will arrest the flow of blood from a large vessel, but there is always, under such circum-

Fig. 61.



stances, great danger of a recurrence so soon as the slough is detached; hence we should not rely upon anything but the ligature, and that should be applied sufficiently tight to divide the middle coat of the artery, and then plastic lymph will be effused and organized for at least three-quarters of an inch above the ligature, which

will permanently obliterate the vessel. In performing amputations, either of two methods may be employed, one known as the circular and the other as the flap operation. The circular operation is not now in so general use as formerly, yet in some cases it should be preferred. Before performing an operation of this character, always take the precaution necessary to prevent excessive hæmorrhage, by pressure made either with the hand or a tourniquet. The pioneers in the profession, when they found it necessary to check the circulation in an extremity, tied a handkerchief, bandage, or some other substance around the limb, and then passed a stick ten or twelve inches long between the skin and bandage and twisted it until the circulation was arrested. This was called the turnstick, but has since received the name of tourniquet. Sir Astley Cooper, when a boy twelve years old, arrested a hæmorrhage from the femoral artery with his handkerchief and a stick until a surgeon could be procured to apply a ligature. A surgeon and a relative in London having heard of the circumstance, sent for him, had him educated in the profession, and you are familiar with the result. I have mentioned this method of arresting hæmorrhage, as it might, under certain circumstances, be found useful. You may apply either the ordinary or horseshoe tourniquet, as may be found most suitable to the occasion. But you should never forget that a tourniquet is always better than pressure made with the hand, because when the muscles become fatigued the pressure diminishes, and an unnecessary loss of blood will be the result. Under the pad of the instrument, which should be placed over the artery, a firm compress of lint or cotton cloth should be inserted, and then the pad should be screwed down so firmly that the pulsation in the artery ceases below the instrument. The horseshoe tourniquet (Fig. 50) derives its name from its shape. When the patient is greatly exhausted, and amputation becomes necessary, I would advise you to use this instrument, as no pressure is made upon the veins, and the blood which they contain will be returned to the general circulation before they are divided. I am satisfied that the femoral at the groin can be compressed so as to control the circulation in the artery more effectually than could be done either with the thumb, by a key, or anything that may be substituted. In my lecture on aneurism, particularly of the arteries of the extremities, I gave directions for the use of this instrument, which it is unnecessary now to repeat.

Circular Operation.—After the application of the tourniquet a circular incision should be made with an amputating knife, by which the skin should be divided; detach that from the subjacent parts either with the same knife or a scalpel, from one to three inches long, according to the size of the extremity to be removed, then turn it up and have it retained by an assistant, and then cut down to the bone, dividing everything that intervenes between the integument and that tissue. The skin and subjacent parts should then be drawn upwards, and the bone divided as high as possible with an amputating saw. The vessels should then, even the most minute, be ligated, and when the hæmorrhage has been entirely arrested, the upper portion of the wound should be closed by the interrupted silver suture, a portion of wet lint placed on the most dependent part of the wound, and the water-dressing applied.

Flap Operation.—Lowdham, in 1767, was the first to perform this. A double-edged knife is required when this method is adopted; pass it perpendicularly downwards from the centre of the limb above until the point comes in contact with the bone, then pass it around and through the limb to the opposite side, and then cut downwards and outwards, making a flap from two to four inches in length. The muscles always retract after being divided, and as it is important to have the bone well protected, it is much better to be obliged to remove a portion of the flap than either to resort to force, to prevent the protrusion of the bone, or to perform a second operation. The latter necessity is not unusual, particularly in amputations when the patient is greatly emaciated. This operation can be performed in less time than the circular, and is always preferred by many surgeons. I think when it becomes necessary to amputate the arm or thigh that it is preferable, but upon the forearm or leg, particularly near the wrist or ankle, the circular should be performed. It not only leaves a better stump, but the wound will also heal much sooner than it would if the flap was partly composed of tendons, muscles, and skin. An amputation may be well performed, and if not properly dressed, and every precaution taken to prevent a casualty, or should any derangement of the general health or constitutional peculiarity exist, then one or more of the following consequences may result. 1st. Hæmorrhage; 2d. Purulent absorption; 3d. Extensive and unhealthy suppuration of the stump; 4th. Exfoliation of bone. Hæmorrhage may be either primary or sec-

ondary. When a vessel has been cut and not ligated, although in consequence of exposure it may not bleed, yet so soon as the wound is dressed and the air excluded, hæmorrhage may occur, which is considered primary. When all the vessels have been ligated and hæmorrhage occurs from the sixth to the tenth day, it is called secondary. A ligature may be applied so near a large branch that the coagulum is not sufficiently long to protect the point of adhesion, and secondary hæmorrhage may follow, but when a ligature has been properly applied, and at a point two or three inches below a large branch, it is impossible for a complication of that character to arise. I have never had secondary hæmorrhage to occur except in one case, and in that the femoral artery was tied near the groin to arrest the flow of blood from a wounded branch of the profunda femoris, which was so profuse as to require immediate relief. On the ninth day the hæmorrhage returned, and the external iliac artery was ligated, and on the third day the patient bled to death from the vessels that were wounded in detaching the peritoneum from the iliac fossa. It would appear that in that case there existed a hæmorrhagic tendency which defied both silk and surgical skill.

I am satisfied that secondary hæmorrhage generally results from the manner of applying the ligature. A single knot should always be preferred to what is called the surgeon's knot, because the former can be drawn sufficiently tight to divide the coats of the vessel, which is indispensable to its obliteration. You are all familiar with the material used, as well as the size and method of applying ligatures. The next difficulty, and that which is most to be dreaded, is purulent absorption, which is almost always fatal; it may occur in any case where a wound exists. The best way to prevent this difficulty is to dress every wound in such a manner as to allow the purulent secretion to escape readily. Never make an effort to heal a stump by the first intention. The flaps, for more than two-thirds, should be approximated and retained in contact with the interrupted silver suture, and in order to secure proper drainage, insert a portion of wet lint in the most dependent portion of the wound. Should these precautions be taken, such a difficulty will seldom occur. I shall always recollect with sorrow that after removing a tumor from the neck of a young man in this city, many years ago, I made an effort to heal it by the first intention. His condition was satisfactory until the fourth day, when he had a chill, followed by a

violent fever and a pain in the right knee. From that time he had two paroxysms of fever every twenty-four hours, with an increase of pain in the articulations. On the seventh day his breathing became difficult, and on the ninth after the tumor was removed he died of purulent absorption.

Shortly afterwards I removed a fibrous tumor from the neck of a woman about forty-five years old. The wound was closed as usual, when union by the first intention is expected. On the fourth day she had a chill, followed by a fever and a pain in the left wrist-joint. The sutures were removed and the wound filled with lint wet with ol. terebinthinæ; very soon the symptoms of pyæmia disappeared. The woman recovered, and is still living. The purulent matter that had been absorbed was not sufficient to prove fatal, and her life was saved by the course of treatment adopted. Suppuration of the stump is not of a very serious character, because it always occurs to a greater or less extent, but when the discharge is thin, bloody, and profuse, tonics, with stimulants, and a generous diet should be prescribed. But, should the secretion be unhealthy in consequence of the existence of inflammation, cold applications, with the antiphlogistic treatment and regimen, should be prescribed and continued until the symptoms are controlled.

Exfoliation of bone can always be prevented by proper management. When the periosteum is injured exfoliation must result. You should, therefore, always use the saw carefully, so as not to detach the periosteum above the point at which the bone is divided. Should any spiculæ remain, or the edges appear rough or abrupt, they should be removed with the bone-forceps to prevent the irritation that must result if they were allowed to remain.

LECTURE XXII.

GENTLEMEN: We shall now continue the consideration of amputations. If we were required to remove healthy limbs, I could describe the operation required in every case, but as such operations must be performed when the part is so much diseased as to be no longer useful, that method should be adopted which will leave that which is preserved in a condition not only to heal readily, but also to be useful and present as little deformity as possible. The fingers may be amputated either at the joints or between them, through the phalanges. The operation frequently becomes necessary from injuries, but rarely from any other cause. The instruments needed are all contained in an ordinary pocket case, except the saw, and consist of a scalpel or bistoury, artery forceps, a small saw or bone forceps, and a needle, armed with silver wire, sufficient for three or four points of the interrupted suture. When it becomes necessary to amputate at the first or second joints, the finger should be flexed as much as possible without giving pain, and the knife should be drawn transversely across from right to left, from an eighth to a quarter of an inch below the upper surface of the finger, by which both the lateral and capsular ligaments should be divided. The knife should then be passed behind the bone and the flap formed on the under side. After the hæmorrhage has been arrested, the flap should be drawn over the articulating surface, and secured by one or more points of the interrupted suture, and the water-dressing applied. If it be impossible to make the flap as directed, then it may be taken either from one or both sides, according to the peculiarity of the injury. Always amputate at the joint, if possible, because there is no danger of a destruction of the cartilage as was formerly supposed, and more of the fingers can be saved by pursuing that course. When the operation is performed through the phalanges, a flap can be formed on each side, and when retracted, the bone may be divided either with a small saw or bone-forceps, as may be most convenient. I generally prefer the latter, because it is more expeditious; it is entirely unobjectionable. It is important in

every operation of this character to save as much of the integument as possible, and after the bone has been divided, any excess that may exist can be easily removed with the scissors. But little danger should be apprehended from hæmorrhage after such operations. When the divided vessels bleed freely, pressure should be made upon the artery on each side by the finger and thumb, and the hæmorrhage arrested until ligatures can be applied. When amputation at the third joint becomes necessary, the flaps should be lateral. The lateral ligament being divided on one side after one flap is made, the knife should be passed through the joint, and the other formed as it is withdrawn. It should be recollected in performing this operation that the extremity of the bone is larger than the body, and consequently, when the knife meets with resistance the edge should be directed outward until the obstacle is passed, and then turned directly inward to divide the lateral ligament, and the operation completed as before directed. When the metacarpal bones are diseased, their removal sometimes becomes necessary; in making incisions for this purpose always be careful to avoid the tendons. This precaution is very important, because if the tendons be divided the corresponding finger will be rendered useless. You may remove the metacarpal bones, and they will be reproduced so that the hand will be as useful as ever, provided the tendons have neither been destroyed by disease nor divided by the knife. Some surgeons recommend extensive incisions for the removal of carious bones, but they are entirely unnecessary. The incision should be only long enough to expose the extremity of the bone, which should be elevated with a director and removed with toothed forceps. Extensive incisions, besides being unnecessary, endanger both the tendons and important bloodvessels, and are neither more safe nor more expeditious. When the hand has been injured, either by gunshot or other injuries, as I have already advised, save as much as possible, and never amputate at the wrist unless the hand has been so much injured as to render it entirely useless. You should always save as much of an extremity as possible. Suppose the hand be crushed; if sufficient integument remains to cover the bones, amputation should be performed at the wrist-joint rather than above the articulation. A semilunar incision should be made on both sides, and when the flaps have been raised the ligaments should be divided and the hand removed. The hæmorrhage may be arrested

by pressure made by a tourniquet to the arm until the arteries can be ligated.

In amputations of the forearm I prefer the circular operation, because it makes a better stump, and the wound will unite much more readily. The first incision should divide the skin and subcutaneous cellular tissue, which should be drawn upwards by an assistant, and then a second circular incision should extend to the bone. After the division of the interosseous ligament, the soft parts should be drawn upwards and the bones divided with a suitable saw, as high as possible, for there is nothing more awkward than to find after an operation that the bones either protrude or can with difficulty be concealed by the flaps. In performing such operations always recollect that the muscles will retract, and make proper allowance for this. The next indication is to check the hæmorrhage by ligating the vessels, which may be isolated either with the tenaculum or artery forceps, because the mouth of the vessel can be closed by the pressure until the ligature is applied, and the surgeon and his assistant protected. Generally, nothing but the artery should be included in the ligature. It is very important to ligate every vessel that bleeds; and never dress the wound until the hæmorrhage has entirely ceased. It is better to wait an hour than to be compelled to remove the dressings. In consequence of pursuing this course, I have not for the last twenty years been compelled to remove the dressings in order to ligate a bleeding vessel.

The success of the operation depends more upon the manner in which the stump is dressed than upon everything else combined. The ligatures, if numerous, should be placed in the most dependent position of the wound, and if not, a strip of wet lint should occupy that position for the purpose of preventing the union of that part of the wound by the first intention. After approximating the edges of the superior portion of the wound by the interrupted silver suture, the water dressing should be put on, and retained by a roller bandage very loosely applied. Many lives have been sacrificed by endeavoring to heal the wound by the first intention. When the edges of the entire wound are approximated, and dry lint is applied and secured by a tight bandage, the purulent secretion cannot escape; often in four or five days the symptoms of pyæmia appear and increase until the function of some important organ is so much disturbed as to destroy life. Almost all young surgeons

apply bandages too tightly. After every operation and injury, the parts implicated must swell, for which proper allowance should always be made. After dressing the wound as directed, if no idiosyncrasy exists, give sulphate of morphia in sufficient doses to relieve the pain, and repeat it as often as necessary during the three or four succeeding days for the purpose of preventing inflammation. I have told you this perhaps more than once before, but whatever is so important to success will bear to be, and should be, repeated.

Upon the forearm, but near the elbow-joint, the flap operation may be performed. A double-edged knife should be passed into the external side of the arm until the point comes in contact with the radius; the blade should then be passed in front of that bone until it appears upon the ulnar side, and then by a sweep downwards and outwards the anterior flap, about three inches long, should be made. The knife should then be inserted at the same point and passed posterior to the bones, and a flap made similar to the first. These flaps should then be drawn upwards by an assistant, and the bones divided by a suitable saw. Formerly, the joints were carefully avoided, but sometimes you can amputate at the elbow-joint with great advantage. I saw Dupuytren perform this operation in the Hôtel Dieu. After making an anterior flap, the head of the radius was detached and the ulna was divided with a saw, leaving the olecranon process and the attachment of the extensor muscles undisturbed. It was much less difficult to divide the ulna with a saw than it would have been to separate it from its attachments, as well as much more expeditious and less dangerous.

When it becomes necessary to amputate the arm, I prefer the circular operation. I cannot boast of the number of operations of this character which I have performed, but I can say that I have never lost a patient after any operation upon the superior extremity. Always practice conservative surgery, because it requires more skill, and it is more creditable to save than to destroy an important member of the body. I prefer the circular operation, because you can make a better stump. The wound can be more effectually drained, and the danger of pyæmia greatly diminished. Always save as much of the arm as possible; but in the effort to do this, you should not fail to leave a sufficient covering for the bone. Amputation at the shoulder-joint may become necessary when the humerus is extensively diseased, or when it is severely injured, either by gunshot or

other wound. You should in such, as in all other cases, be governed by circumstances, hence the operation selected must depend on the character of the injury. It is sometimes most convenient to make a flap of the deltoid muscle by passing the knife transversely between the acromion process of the scapula and the head of the humerus, by which the capsular ligament will be opened so as to avoid the deltoid muscle, which should then be divided by a sweep of the knife directed downward and outward. The flap should now be turned upward to expose the joint. The head of the humerus should be dislocated, and as soon as the artery can be compressed by a competent assistant, the lower or inferior flap should be made and the extremity removed. A good assistant is very important when this operation is performed, as the hæmorrhage can be controlled much more easily by compressing the axillary than the subclavian artery. The first time I performed this operation in California was upon a man in the County Hospital, who had caries of the entire humerus, as well as of about three inches of the superior extremities of both the radius and ulna. So soon as the articulating extremity of the humerus was dislodged, Dr. R. McMillan, of this city, arrested the circulation in the artery by passing his fingers behind the bone and making pressure above the point at which the artery was divided in making the flap. You may find it necessary, in consequence of the condition of the soft parts, to make an anterior and posterior flap, which is not more difficult than the operation described. The knife should be entered on the outer side of the humerus perpendicularly from above downwards, so as to make the external flap, which should be at least four inches in length. The capsular ligament should then be divided, and the head of the bone thrown outwards. Before completing the operation, the artery should be controlled by an assistant, as before directed, and an internal flap made to correspond both in width and length with the external. The wound resulting from an amputation at the shoulder-joint should be dressed in the usual way, great care being taken to secure the escape of the secretions, on account of the great extent of the wound.

When it becomes necessary to remove the toes, the same course should be pursued which was recommended in amputation of the fingers. Erichsen recommends a tourniquet to be applied to the femoral artery, provided the patient be greatly debilitated, which, I

think, is entirely unnecessary, as the hæmorrhage, if profuse, can be controlled by pressure made upon the anterior and posterior tibial arteries. The toes may be removed either at the joints or through the bones, between the articulations, but when either the great or little toes are amputated, it will contribute greatly to the comfort of the patient to remove at the same time a portion of the extremity of the metatarsal bone. If allowed to remain, this would prove a source of constant annoyance, as the patient would find it impossible to wear an ordinary shoe without great inconvenience. It should be done obliquely, either with a small saw or bone-forceps, which I prefer, and with the variety exhibited, they can be removed wherever it may be necessary. When a metatarsal bone is only partially diseased, the carious portion should be exposed and detached either with the bone-forceps or chisel, according to the locality and extent of the disease. When the integuments as well as the metatarsal bones are so much diseased that the removal of the latter would not effect a cure, there are two operations that may be performed, either of which is better than amputation above the ankle-joint. In the first, which is called Chopart's, both the astragalus and os calcis are saved. Formerly the os cuboides was not disturbed, but it is now considered better to remove it before the wound is dressed. In this operation the first incision should be semilunar and extend from the projection made by the articulation of the metatarsal bone of the little toe to a corresponding point on the opposite side. When the flap has been dissected up, the toes should be pressed downwards and the knife drawn directly across the foot so as to pass through in front of the astragalus, cuboid, and os calcis. The lower flap can be formed from the sole of the foot; should that, however, be destroyed by disease, and the integument on the upper portion be healthy, a sufficient quantity should be preserved to cover in the wound, after the cuboid has been removed. Some surgeons dissect up the inferior flap before the superior incision is made, which, I think, is objectionable, because it renders the operation more tedious and less elegant, it being impossible to determine accurately the precise point at which the disarticulation can be effected. When it becomes necessary to operate above the point recommended by Chopart, Pirogoff's operation, which is a modification of Syme's, should be performed. The first incision should be semilunar, and extend from the internal to the external malleolus. When the flap has been dissected up the lat-

eral ligaments of the ankle-joint should be severed, the astragalus removed, and then a transverse incision should be made across the sole of the foot in front of the os calcis, and then that bone should be divided longitudinally through the centre with an amputating saw; the articulating surfaces of the tibia and fibula should be removed, and the portion of the os calcis which remains should be brought up and retained in contact with the extremities of the bones of the leg by the interrupted silver suture. When this operation is performed, union takes place between the os calcis and the tibia as in an ordinary fracture, and the stump is superior to that which results either from Chopart's or Syme's operations. You have seen this operation performed twice in the hospital, and I was entirely satisfied with the result. When Pirogoff's operation is performed, the anterior portion of the bones of the leg should be left longer than the posterior, as a better and more useful stump will result. Syme performed the operation as described, except that instead of dividing the os calcis it was removed, and the stump was covered only by the ordinary integument of the heel. I have performed every operation that has been recommended upon the foot, and I prefer Pirogoff's, whether the modification I have recommended be adopted or not, to either Chopart's or Syme's. The extremity is longer than in Syme's, and more useful than in Chopart's, in consequence of the elevation of the heel in the latter, which is unavoidable, unless the tendo Achillis is divided, and the subsequent treatment properly conducted. In all operations, either upon the foot or leg, the tourniquet should always be applied to prevent excessive hæmorrhage, and as much of the limb should be saved as possible. When it becomes necessary to amputate above the ankle, the circular operation should always be preferred. Near the knee-joint a flap can be taken from the posterior part of the leg long enough to cover the bones and leave a good stump. Formerly when the foot or ankle were diseased, the leg was always removed as near the knee-joint as possible, because the ordinary wooden leg was used with the knee resting upon a pad, and by operating as near the knee as possible the annoyance and inconvenience resulting from the posterior projection of the stump was removed. Palmer's artificial leg is composed of cylinders and joints, the former being made to correspond with the size of the stump, and so arranged that the pressure is equally distributed. If the disease of the leg be so near the knee that the operation cannot be

performed below the joint, and the articulating surfaces are not implicated, you can then either operate through the joint or a few inches above. The former will leave a better stump, particularly when the patella can be saved, as the attachment of the extensor muscles will not be disturbed. After the anterior flap has been raised, the knife should be passed behind the bones and a flap from five to six inches formed from the gastrocnemii muscles. It is very important to provide a sufficient covering, and if in excess, it can easily be removed. Prof. Gross thinks that the articulating surface should not be disturbed, and Dr. Thomas Wells, of Columbia, South Carolina, amputated at the knee-joint successfully as early as 1833. Should the articulating surface be diseased, then the bone should be removed as near the joint as possible, there being less danger of osteitis resulting from passing the saw through the spongy than the solid portion of the bone.

Amputation at the knee-joint was performed by Hildanus in 1581, Velpeau revived it in 1830, and Dr. Thomas Wells, as before mentioned, operated in 1833. Since that time it has been practiced by the best surgeons in the United States in suitable cases.

When the thigh must be removed above, but near the knee, you should make the anterior flap from the integument covering the joint, and the posterior as already described, and save as much of the femur as possible, for even one inch is of great importance to the patient. A few inches higher up an amputating knife may be passed perpendicularly as may be thought advisable, and a flap formed by a single sweep of the knife, and the second in the same manner. When these are retracted the bone should be divided, the arteries secured, and the wound dressed as already described.

Amputation at the hip-joint is always a very grave operation, and has frequently proved fatal. You should therefore feel that it is indispensable, and that it is recommended as a last alternative. In one of the operations which I performed at the hip-joint, the patient's life was endangered from hæmorrhage in consequence of the assistant having failed to control the circulation of the femoral artery. When that vessel was divided the blood flew across the room in a stream as large as the vessel, until it was seized with the forefinger and thumb of the left hand and held until a ligature was applied. In such cases never rely upon an assistant, but apply Prof. Gross's tourniquet either below or above Poupart's ligament, and then you

will feel that your patient is not in danger of losing his life from that cause.

The operation may be performed by passing the knife from a point two inches below the anterior superior spinous process of the ilium, obliquely downwards, so as to endanger neither the other thigh, the scrotum, nor the urethra. The knife should be passed as near the bone as possible, and the flap should be four or five inches in length. The capsular ligament should then be divided and the head of the bone dislocated; the posterior flap should be cut corresponding with the anterior. Should an external and internal flap be preferred, the external should be first made, and after the head of the bone is dislocated an assistant should hold the soft parts in such a manner as to make sufficient pressure upon the artery to prevent all risk of hæmorrhage. After ligating the vessels the wound should be closed by the interrupted silver suture, the water dressing applied, and half a grain of the sulph. morphine administered to relieve pain. Should reaction not occur speedily, stimulants should be administered as indicated by the condition of the patient.

LECTURE XXIII.

GENTLEMEN: As announced, I will to-day lecture on fractures, an exceedingly important subject to every practitioner of medicine. Almost all the suits for malpractice are based upon the alleged improper treatment of fractures, and sometimes of the most simple variety. It is necessary, therefore, that you should understand them perfectly.

Bones differ from, and are distinguished from, all other portions of the body by their great power of reproduction. When a bone is broken a sufficient quantity of new bone is formed to unite the extremities, which does not occur in any other tissue of the body. For instance, if a muscle be divided, it will not unite except by the intervention of fibrous tissue, but even when a bone is shattered, union will take place, provided the soft parts are not too seriously injured. Even when a bone loses its vitality, it may be removed, and should the periosteum remain, new bone will be reproduced. When I published, a few years since, in the *Pacific Medical Journal*, that bones, joints, and ligaments could be reproduced, the daily papers were filled with abusive articles, written by members of the profession in this city, in which they at first contended that it was impossible and that my statements were not true. But when the name and address of every party who had been operated upon was given, and the result proved that not only the bones and joints of entire fingers can be reproduced, but also the bones of the foot and ankle, the inferior maxillary, as well as the bones of the forearm, with the articulating surfaces, they protested that everything claimed was and had been known to the profession for more than forty years, and hence that no discovery had been made.

A fracture is a solution of continuity in a bone, produced by violence, which may act directly upon the part injured. Suppose a heavy weight were to fall upon my arm, the bone would be broken directly at the point where the force was applied, or it may result from the force being applied to a distant part. If a person were to fall upon the feet, from an elevation of five or six yards, it is highly

probable that one or both thighs would be fractured. I am now treating a patient who has a fracture of both legs, produced by jumping from the driver's seat of a stage-coach when it was in rapid motion. The force was applied to the feet, and the legs were fractured several inches above the ankles. A fracture may result from inordinate muscular action. I treated a case, many years ago, of fracture of the thigh-bone near the centre, sustained by a young powerful man in running a foot race. The patella is also sometimes fractured by the action of the extensor muscles of the thigh. I have treated two cases of that character, which resulted from carriage drivers being dragged from the seat; in consequence of the great muscular effort made to save themselves the patella was fractured transversely in both cases. Fractures occur, however, more frequently from direct violence, or from force being applied to a distant part, than from muscular contraction.

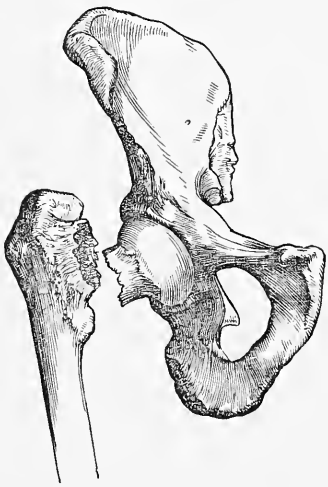
Fractures occur at all ages, but the bone is not always broken at the same point from a similar cause. When the thigh of a child is fractured, it is generally about the middle, but when an old man sustains an injury of that character, it occurs almost always at the neck of the bone. You should not forget this fact, as it might lead to as great a mistake as was committed by Lisfranc, at the La Pitié Hospital, in Paris. He announced to the class that an old man in the ward had a dislocation of the hip-joint, which would be reduced the following day. Some of the students formed a different opinion of the character of the injury. On the day appointed an immense crowd of students assembled, both to see a case of dislocation of the hip-joint, which rarely occurs, as well as to witness the reduction by so distinguished a surgeon. When extension was made by three or four assistants, the limb was readily placed in its proper position, but so soon as the extending power was removed it presented its former appearance. The students were soon convinced that an error had been made in the diagnosis, and their remarks were anything but complimentary to the surgeon. I treated a case of this character, which occurred to an old physician (he was in his one hundred and twelfth year), that was mistaken for a dislocation of the hip-joint. He suffered greatly from the effort made by his former attendant to effect the reduction. Always be careful in expressing an opinion, particularly if the patient has passed the age of sixty, because the bones generally by that time become brittle, and are more liable to

break than to be dislocated. I have treated many cases of fracture of the neck of the femur in old people, but never a dislocation of the hip-joint.

Fractures may be either transverse or oblique. If a bone be broken directly across the shaft it is called a transverse fracture, and if obliquely in respect to the axis, it is called an oblique fracture, which is much the most difficult to treat, because the displacement is greater and it is more difficult to retain the broken ends in apposition. In a transverse fracture, when the extremities of the bones are placed in contact, they can be easily retained in that position by the application of moderate pressure, and in such cases there will be but little, if any, shortening of the limb. In oblique fractures of the thigh it requires great care to prevent a diminution in the length, and some surgeons contend that from half to three-quarters of an inch is inevitable. I am satisfied that it is not so, and many of you saw a case treated in the County Hospital in which no difference could be detected in the length of the extremities.

A fracture is said to be simple, when the bone is broken and the soft parts have sustained no injury. This cut (Fig. 62) represents a

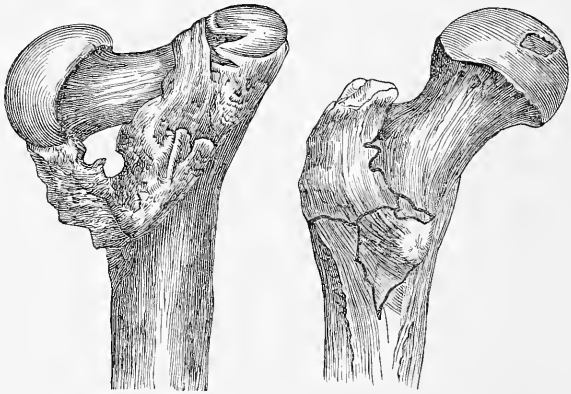
Fig. 62.



simple transverse fracture of the neck, with the head of the bone in the acetabulum. The following cut (Fig. 63), will give you a correct

idea of the appearance of a bone broken in several pieces, or in other words shattered. This is called a comminuted fracture. The words single and comminuted, simple and compound, include every variety, as both transverse and oblique fractures may be either single or comminuted. A single and simple fracture is said to exist when the

Fig. 63.



bone is broken only at one point, and no external wound exists, but when a bone is crushed, either with or without an external wound, the fracture is called comminuted. Whenever a solution of continuity in a bone is complicated with an external wound communicating with it, you have a case of compound fracture. Should the same injury to the bones exist, without the external wound, it would be called simple. To repeat, when a fracture extends straight across the body of a bone it is transverse, oblique when the opposite sides are broken at different points, single when there is a simple solution of continuity, comminuted when the bone is broken into several pieces, and compound when complicated with an external wound.

Symptoms.—Distortion of the limb is rarely absent. Even when the displacement of the extremities is slight, the appearance of the part differs from that which it ordinarily presents. If the thigh-bone be fractured obliquely, the distortion and shortening of the extremity will be great in proportion to the direction, the violence, and nature of the cause. In such cases, when improperly treated, the thigh is frequently shortened three or four inches, and the patient rendered a cripple. From three-fourths of an inch to an inch is

excusable, and has been so characterized by the best authorities on surgery.

There is a total loss of power when the thigh or arm is fractured, but if only one bone of the leg or forearm is broken, there is a diminution but not a total loss; there is also preternatural mobility. The limb can be easily moved in any direction without the application of much force, which was the reason that some of the students had arrived at the conclusion that the patient in the La Pitié Hospital, whom I have already mentioned, had a fracture of the neck of the thigh-bone instead of a dislocation of the hip-joint. There is always more or less swelling from effusion, and for that reason, whenever you are called to a case of fracture, it should be reduced before that occurs. It depends both upon the extravasation of blood and the effusion of serum, and results from the increased action of the vessels produced by the irritation inseparable from such an injury.

The patient always suffers from pain, and often from a spasmodic twitching of the muscles, which exists in a greater or less degree according to the locality of the injury. In fractures of the arm, particularly if accompanied by much laceration of the muscles, this symptom is exceedingly troublesome and distressing. It also frequently occurs in fractures both of the leg and thigh, and in the latter it is generally very annoying at night, unless prevented by the administration of some preparation of opium. The most important symptom of fracture is crepitation. This is always present. It can generally be both felt and heard, and when you have once experienced the sensation imparted to the fingers by rubbing the jagged ends of the bone together you can never mistake it for anything else. There is nothing which resembles it, except it be the crackling produced by the contraction of an injured muscle, and then all the other symptoms of fracture are absent. This only occurs when the sheath of a tendon has been injured in consequence of the absence of the lubricating fluid, the secretion of which is arrested by the inflammation produced by the injury.

When a fracture exists, by what agency is the bone united? This was formerly a controverted point, many contending that the periosteum did not perform that office, and even within the last few years an eminent surgeon of this city published an article in the first number of the *Pacific Medical Journal*, in which he not only

asserted but endeavored to prove that the periosteum did not contribute in the slightest degree, either to the reproduction or reunion of bone, which opinion is not now sustained by any respectable surgeon. Without the periosteum, a bone can neither live, be restored when removed, nor be united when fractured. Whenever a bone is deprived of its periosteum the part exposed always loses its vitality. The best proof I have ever had of the truth of this assertion was presented by a case of cancer of the scalp, which I treated in the St. Mary's Hospital of this city. After the tumor was removed, believing it to be malignant, in order to prevent a recurrence the periosteum was detached from the entire surface of the cranium, to which the tumor was attached. In three or four months the external table of the bone exfoliated. The most unpleasant recollection connected with that case is that the operation did not afford permanent relief. After being apparently well for a few months, the internal table of the bone became diseased, which being destroyed, the brain soon became implicated and a fatal result ensued.

A fracture should be reduced as soon after the receipt of the injury as possible, and before the surrounding parts become sufficiently swollen to conceal the true character of the injury; it should then be placed in the position least inconvenient to the patient. A fractured bone, after the first six or eight hours, is not necessarily painful, but such patients usually suffer greatly from the dressings. Avoid tight bandages always, and more particularly at first. If sufficient allowance is not made for the swelling that must follow such an injury, the patient will suffer so much pain that even the free use of opium will not insure him sleep; the loss of which will produce so much constitutional disturbance, that the object of the treatment will be defeated. Always apply the bandages for seven or eight days, tight enough only to keep the extremities of the bone from irritating the surrounding parts, and then you should ascertain the condition of the limb and the position of the fracture. By that time, if the proper treatment has been pursued, the swelling will have disappeared sufficiently to enable you to judge whether a change is necessary or not, and then it should be dressed as you intend it to remain, because now the deposition of coagulable lymph commences, and very soon the ends of the bone will be united; if they have not been properly adjusted, it not only becomes difficult to change the position, but also exposes the patient

to the danger of a false joint. I repeat, in seven days sufficient action is established in the periosteum in the vicinity of the fracture to surround the extremities of the bone, which gradually becomes more and more solid by the deposition of ossific matter, until it becomes a perfect bone in every respect, except that the medullary canal is absent, the entire bone being solid and consequently less liable to break at that point than at any other, provided the extremities have been properly adjusted and retained in contact sufficiently long for perfect union to occur. It is impossible for any surgeon to dress a fractured limb permanently, directly after the accident has occurred, without applying the bandages too tight for the safety of the limb and the comfort of the patient. That is the great danger in the treatment of fractures, and the reason why so many deformities and false joints result from such injuries. If you apply a roller bandage at all, which I seldom do, let it be loose, otherwise, in three or four hours the pain will be excruciating, and if the constriction be not removed it may produce strangulation. After dressing the limb for the first time, always leave directions that if the bandages become so tight as to produce pain they should be removed or divided with scissors, and the splints secured by the application of three or four strips about an inch in width. At the wrist and ankle-joints the bones have but little protection, and if the splints are not well padded they not only produce pain, but also ulceration of the skin and great subsequent annoyance. Compound fractures are more dangerous than those of a simple character. They are not only more dangerous, but their treatment is more tedious and difficult. In such cases, when one of the extremities of the fractured bone protrudes through the wound, and cannot be replaced without resorting to great force, it should be removed with an amputating saw. The difficulty experienced in such cases results from the violent contraction of the muscles. Union is much more certain than if replaced by the employment of force sufficient to seriously injure the soft parts. The wound may sometimes be enlarged with decided advantage, and should that fail, then adopt the treatment already recommended. Suppose you were to have a case of compound fracture, in which the main artery of the limb was wounded, with considerable contusion and laceration of the soft parts, then the limb should be amputated as soon as reaction occurs. I am now treating a case of a gentleman from Knight's

Landing, on the Sacramento River, whose arm was terribly lacerated by a threshing machine. If I had seen him during the second stage, or before inflammation was established, I would have amputated, but as seven or eight days had elapsed before he arrived in San Francisco, I determined to wait until suppuration was established, and I now find that the arm can be saved, provided his general health does not suffer from the profuse discharge inseparable from so extensive a wound. The skin from the anterior portion of the arm from the shoulder to the wrist was torn off, leaving the flexor muscles and tendons all exposed, and one of the bones of the forearm was fractured. The brachial artery was ligated. The extensor muscles and tendons sloughed and the radius exfoliated. The fracture united and the wound healed, although the hand, in consequence of the loss of the muscles, will not be very useful. The phalanges of the fingers and toes are very liable to be fractured, usually as the result of blows or falls. A gentleman of this city fractured the forefinger of the right hand in alighting from his buggy, by passing it between the dasher and the iron by which it is surrounded. I treated, in the United States Marine Hospital, a case of fracture of the great toe, produced by falling through the scuttle of a ship; the patient having extended his feet to break the violence of the fall, the great toe was the first to come in contact with the deck, and was fractured. Fractures both of the toes and fingers occur more frequently from direct violence. The treatment is very simple. After reducing the fracture, envelop the part either with cotton or lint, and then apply either thin pasteboard or blotting-paper, instead of wooden splints, as the former are less painful and equally effectual. If necessary, a small wooden splint may be applied externally and secured by a bandage, applied so as simply to retain it in a proper position. I sometimes include in the bandage one of the fingers or toes that has not been injured, and have found it as good a splint as could be applied. There is no danger of deformity resulting from a fracture of this character, unless it be neglected. Always interpose cotton or lint between the fingers or toes to prevent the irritation that would certainly result if they were kept in contact without the intervention of the substances mentioned. A fracture of the metacarpal bones is much more difficult to treat, because the flexor muscles, being very powerful, have a tendency to draw the outer extremities of the bones forward and produce a deformity on

the back of the hand. In consequence of this, I have found more difficulty in treating fractures of the metacarpal bones than those in any other location. In such cases the splint should extend from the wrist on the back of the hand to the extremity of the fingers, and a compress of cotton should be applied over the point of the fracture. The bone can be kept straight if sufficient pressure is made upon the back of the hand to counteract the flexor muscles. A compress of cotton is preferable to one of any other material, because it is almost impossible to produce ulceration of the skin when a sufficient quantity is interposed between it and the splint, even when considerable pressure is made. When all the metatarsal bones are fractured in the same manner, which sometimes occurs, a broad splint, well padded with cotton to prevent ulceration, should be applied to the bottom or sole of the foot, and secured by a bandage so as to prevent displacement; should inflammation supervene, employ the remedies previously recommended. The fibula may be fractured either by direct violence or by the foot being twisted outwards with sufficient force; the fracture usually takes place about an inch and a half above the lower extremity of the bone. There is seldom much, if any, displacement, and but one splint should be used in the treatment. This splint should be straight, and when well padded with cotton, should be applied on the inner or tibial side of the leg and secured by a bandage with the precautions already frequently recommended. No other dressing is necessary, and if the bandage is not applied sufficiently tight to force the fibula inward, and thereby render it shorter than the tibia, no deformity can result. Should the patient be dissatisfied with the use of only one splint, Roe's leg splints should be substituted, which, by the use of crutches, will enable the patient to leave his bed sooner than would be prudent provided only one splint had been applied.

It is very rare that both the tibia and fibula are fractured at the same point. The fibula is usually broken near the ankle-joint, and the tibia near the centre or even above, although they may both be broken at the same point near the ankle. In a case of that character there is always danger of anchylosis, in consequence of the violence offered to the articulating surfaces being liable to be followed by inflammation. In such cases Roe's leg splints should be applied, and particular attention given to the ankle-joint, which should be moved, after the third week, at least every two or three days, to prevent anchylosis.

LECTURE XXIV.

GENTLEMEN: When the last lecture closed, I had not finished discussing fractures of the leg. Oblique fractures of the tibia are exceedingly difficult to treat successfully, and some eminent surgeons believe that in such cases there is almost always a slight shortening of the leg. I think this can be avoided by the application of four splints. The posterior is intended to counteract the action of the muscles on the posterior portion of the leg, the lateral to prevent either an external or internal curvature, and the anterior, which, when well padded, should be applied to the tibia with a compress over the superior fragment to prevent the projection of that extremity, which almost always occurs when that precaution is not taken. You have all seen several cases of oblique fracture of the tibia treated in the hospital, and in every case the bone united without either deformity or shortening. Besides, you had an opportunity of seeing the splints applied and of ascertaining the result. When the bones of the leg are fractured near the knee-joint, I always place the limb upon Roe's double inclined plane, and apply lateral splints, unless the injury is so near the knee as to render the latter unnecessary. In compound fracture of the bones of the leg the size and position of the wound will render some modification in the treatment necessary. Should the wound be over the tibia, which is usually the case, the posterior splint must be relied upon entirely to counteract the gastrocnemii muscles, which, if not controlled, produce an anterior curvature and sometimes a displacement sufficient to render it difficult for union to occur. When the splints recommended cannot be obtained, others can be made that will answer the same purpose, out of stiff pasteboard, gutta-percha, or sole leather, either of which, when cut in proper shape, and softened by the application of warm water, can be moulded to the shape of the limb, and when padded so as to prevent undue pressure upon the most prominent points, will enable you, by the application of a common roller and the straps usually employed, to prevent the dis-

placement of the bones after they have been reduced. The wound should be covered, at first with cloths wet with cold water, and after the period at which inflammation usually occurs, the warm-water dressing should be substituted to hasten the cicatrization of the wound. In such cases the bandage should be so put on that the wound can be dressed without disturbing the splints, and in order to give support to the wound, a compress may be applied and secured by a strip of bandage passed over and tied upon the posterior part of the leg. After suppurative inflammation is established, simple cerate should be substituted for the warm-water dressing, and secured by a compress of cotton and a strip of bandage so that the dressings will not adhere to the ulcer, which can then be exposed without disturbing the splints.

If physicians relied more on their own common sense than on the rules of authorities in the treatment of fractures, there would not be half so many cases of deformity resulting from such injuries as are daily presented. I would as soon think of committing suicide as of placing an oblique fracture of the tibia in an ordinary fracture-box, filled with either sand, sawdust, or any of the other substances used for that purpose. The limb should always be kept in view, so that any displacement may be perceived and corrected before the bone becomes so firmly united as to render it impossible. When the fracture-box is employed in such cases, the limb is generally and unfortunately almost always deformed. If, however, it be dressed so that its position can be ascertained, should the dressings be deranged, either by accident or design, they can be replaced, and any permanent difficulty prevented. Many physicians, but I cannot call them surgeons, apply the starch bandage in recent fractures. I have known them to be applied in this city in compound fractures of the leg the next day after the receipt of the injury. It is always improper, because it is impossible to determine how much tumefaction will occur, and frequently, when the bandage is removed, not only extensive ulceration, but great displacements, will be found to exist. In compound fracture always leave the wound exposed, dress it every day, and then you will feel, if any unfavorable symptom occurs, that the case has been treated properly and that you are not guilty of any neglect. Should inflammation occur, if the patient be in full health, apply leeches, and then either the evaporating lotion or cold irrigation, according to the violence of the dis-

eased action. I have been practicing surgery for thirty years, and I have never had a case of simple fracture in which ulceration of the skin resulted either from inflammation or from the improper pressure either of the bandages or splints, except in the first case I treated, which was a fracture of the fore and middle fingers of the left hand. I was taught by a very distinguished surgeon that if a bandage was properly applied the vitality of the part would not be destroyed, even by the use of a force equal to ten horse-power. Both the fingers were tightly bandaged, and splints applied; at the expiration of a week, when they were removed, nothing remained but the skin and bones, and I had the credit of amputating two fingers which should have been saved. This case taught me a valuable lesson. I saw by the result the danger of applying tight bandages at an early period, and have since always carefully avoided them. The tibia may be fractured near the upper extremity, and even at the head, which is always a serious injury, in consequence of the danger that the knee-joint may become implicated, and when inflammation does occur, the best possible result that can be obtained is anchylosis of the joint. In such cases place the limb upon a double inclined plane, either Roe's splint or the one which I employ in fractures of the thigh in the hospital, either with or without lateral splints, according to the character of the injury.

Fracture of the patella, although not very common, is interesting, in consequence of the difficulty experienced in its treatment. If a fracture of this character is not managed skilfully, the usefulness of the limb is permanently impaired. The patella may be fractured either transversely or longitudinally; it is generally simple. I have treated five cases in this city, and they were all simple and transverse. Many surgeons believe that in such cases bony union cannot take place. From the result of my experience, I am entitled to say that it can and does frequently occur when cases are properly managed. The patella, as you are all aware, forms the anterior portion of the knee-joint; it is lined on the inside by the synovial membrane, and when a bone is fractured within the capsule of a joint, as the patella and neck of the thigh-bone, it is always difficult to effect bony union, but still it does sometimes take place. In consequence of the difficulty experienced in the treatment of such cases, they have received great attention, and numerous methods have been adopted for the purpose, if bony union should not take place,

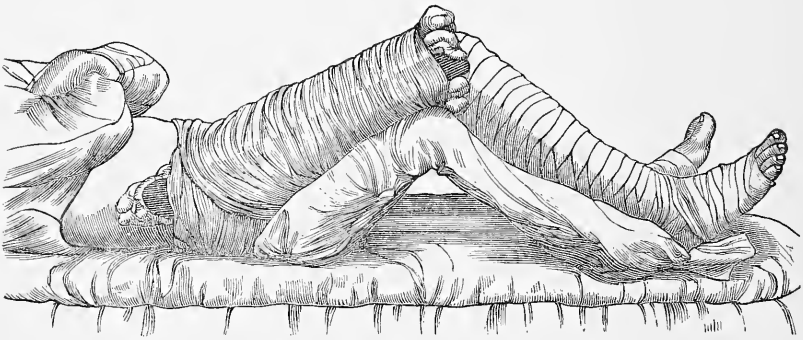
to render the separation of the fragments as small as possible. M. Malgaigne, a distinguished surgeon of Paris, invented an instrument, which consists of double hooks connected by a screw, after being passed through the skin are inserted into each fragment, then they are approximated and retained in contact with the screw. I have succeeded with this instrument; but the most satisfactory result has been obtained by the use of the ring, recommended by Prof. Paul F. Eve, of Nashville, Tennessee. The fragments should be, in the first place, approximated and retained in that position by the application of adhesive plaster, and then the part should be covered with cotton batting, over which the ring should be applied and secured by the straps and buckles which are attached. By the application of this instrument the fragments can be brought and retained directly in contact, and if the limb be extended and kept in that position for four or five weeks, the result will be satisfactory. To the genius of Prof. Eve, once my competitor, we are indebted for this simple and valuable instrument, and if he had never made any other contribution to surgery, it alone would entitle him to the gratitude of the profession, and transmit his name to posterity as one of the benefactors of mankind.

After the application of the ring the limb should be kept extended, and after the third week the knee should be partially flexed; this should be repeated every three or four days, until union has taken place. Wherever there is a hardware store, and a shoemaker or a saddler, the ring can be procured ready for application in a few hours. Should you be required to treat a case of this character when it is impossible to obtain this instument, then you may either apply a figure-of-eight bandage or a roller both above and below the fragments, and approximate them by strips of cloth passed under both on each side of the knee, and tied sufficiently tight to bring the fractured surfaces in contact, which should be tightened when rendered necessary by the stretching of the bandages.

The femur, notwithstanding its great strength, is occasionally fractured. In mature age fractures occur more frequently at the lower third, in children near the middle, and in old people at the neck or near the upper extremity of the bone. In one hundred and twenty-six cases of fracture of the thigh, the neck of the bone was fractured in twenty-six, and that is about the ordinary occurrence of such cases. The next point to be considered is the question—can

bony union occur in such cases? Malgaigne, in his work on surgery, says that he has investigated the subject carefully, and that three cases have come within his knowledge in which bony union of the neck of the thigh-bone did occur. Smith, in his work, has reported seven cases. This bone may be broken at any point. Fig. 62 (page 271), represents a fracture of the neck of the thigh-bone within the capsule. Whenever fracture takes place within the capsule it is said to be a fracture of the neck, and I have given the result of all the cases that have occurred both in Europe and America. The fracture may be either within the capsule, near its attachment below the trochanter major, or indeed at any point from the trochanters to the condyles. It is interesting to see the effort which nature sometimes makes to restore the usefulness of the bone after such an injury. One of the most extraordinary specimens connected with injuries of this part occurred in the neck of a thigh-bone fractured near the trochanter major; during the existence of the reparative process, a probe or process of bone extending from the neck to the shaft several inches below was produced, rendering the occurrence of the same difficulty almost impossible, as the bone would fracture at

Fig. 64.



some other point sooner than at the one originally injured. The knowledge of the correct method of treating fractures of this kind is very important, and I think very easily acquired. Various methods have been adopted and advocated, but the most simple is the best, and should always be selected. What is called a "fracture chair" is an exceedingly convenient double inclined plane, but I do not think that it possesses any advantages over the one used at the

County Hospital, which is made of two pieces of inch plank, two feet long and about one inch in width, secured as appears in the plate; a pillow should be placed upon each side. This is the instrument that was used by Dupuytren in all fractures of this bone. Desault's splint, modified by Boyer, was abandoned by the latter long before his death, in consequence of the ulceration of the groin and foot inseparable from its application. If you wish to make extension and counterextension, use what is called the hospital splint. The extension should be made by adhesive strips upon each side of the leg, which should be previously shaved, and with them there is no danger of producing ulceration either of the instep or the heel, which almost always results if bandages are employed for that purpose. The upper extremity of the splint is secured by a strap buckled around the waist, which constitutes the counterextension. This is decidedly superior either to Desault's or Physick's splint, which was formerly almost universally employed. This extended to the axilla, and the patient was confined upon his back in the most uncomfortable position that can be imagined. In order to prevent the curvature of the thigh outwards, this splint is all that is necessary. It extends from the knee to the pelvis, and should be secured as will be hereafter directed. On the seventh day after the receipt of the injury, apply a bandage from the instep to the hip, the limb being extended by an assistant to the proper length. The splint exhibited should be applied to the outer side of the thigh, and shorter splints upon the inner and superior surfaces of the limb; when secured by a roller bandage, three strips should be placed over it, so that the splints can be retained in a proper position by tightening them as often as may be necessary, which will render the removal of the bandage and the disturbance of the relation of the bones unnecessary. Then place the limb upon the double inclined plane on a large pillow. If the patient be young, the use of the limb will be recovered with less deformity and less suffering than by any other treatment that can be adopted. The splints should be well padded with cotton; the bandages should not be too tight; and if these precautions are taken you will not find any more difficulty in treating fractures of the thigh than those of any other bone. In cases of compound fracture it will be necessary to dress the wound every day; therefore the bandage should be put on in such a man-

ner as to leave the wound exposed, and after the application of lint, covered with simple cerate, a compress of cotton should be applied and secured by a broad strip, which should be tied on the opposite side of the leg. Always arrange the dressings in such a manner that the wound can be examined every day, so as to ascertain its condition. When a fracture of the thigh is treated in this manner it is impossible for the limb to be deformed. There may be a slight shortening, and according to the best authorities you should expect three-quarters of an inch. If the diminution in the length of the limb is greater, you may feel that you have not treated the case skilfully, unless it be one in which there existed great contusion, or laceration followed by violent inflammation, which rendered it impossible to get a better result. But if the fracture be oblique and simple, should the shortening of the limb be greater than an inch, the result should be considered very unsatisfactory. Dupuytren, who was surgeon-in-chief to the Hôtel Dieu, in Paris, and was the greatest man at that time in the profession, always used the short splints and the double inclined plane, and with extraordinary success. We should always be governed by the opinions of such men. An experienced surgeon can apply either Desault's or Physick's splints, and the result will be satisfactory, but a young man may find after he has kept his patient on his back with extension and counterextension for two or three months, that the knee-joint either moves with difficulty or is entirely anchylosed; but when the short splints and the double inclined plane are applied, the knee-joint after the third week can be moved every day without disturbing the dressings, and such a complication, which is always serious, is rendered impossible. In Hamilton's able work on fractures you will find every successful method of treatment described by one perfectly familiar with the subject, but when you engage in practice, you will soon be convinced that the double inclined plane and short splints are generally better than a more complicated apparatus. In the treatment of fractures of the thigh in children, a large pillow forms as good a double inclined plane as can be made, which, with the splints recommended, will always prevent both shortening and deformity. There is another very important fact connected with the treatment of fractures with which you should be familiar, and that is, if the limb be too tightly bandaged it becomes atrophied to such an extent that there is really not

sufficient vitality in the part to produce any union of the bone. I have frequently seen Dupuytren, when he found that the limb was becoming atrophied, which sometimes occurs even when too much pressure has not been made, have the splints removed, and after having the limb washed with warm water, place it upon a pillow and allow it to remain there until it acquired its original size before reapplying the splint. And in some cases it becomes necessary to remove the splints two or three times in order to avoid a false joint, or, in other words, to favor the deposition of a sufficient quantity of lymph and ossific matter, to produce a perfect union of the extremities of a fractured bone.

LECTURE XXV.

GENTLEMEN: At my last lecture the hour expired before I reached the subject of fractures of the neck of the thigh-bone. In their treatment, whether intra or extra-capsular, the same course should be pursued which has been recommended in fractures of the lower extremity or shaft of the bone, and for the best results which I have obtained in such cases, I am indebted to the use of the double inclined plane. After placing cotton batting between the feet, they should be secured firmly together by a roller bandage, and then the extremities should be placed upon the double inclined plane, after applying the external splint, extending from the pelvis to the knee, and then if bony union takes place at all, it is impossible for the limb to be shortened. In one case, treated in that manner, there was no perceptible shortening, and I think if bony union ever does take place, after such an injury, it then occurred.

Fingers.—Fractures of the fingers may be either simple or compound. I have frequently met with both. After reducing the fracture, cover the finger with wet lint, and then apply thin pasteboard splints or common blotting-paper, which will answer equally well, then a bandage, so as to retain the extremities of the bone in contact. Always apply the bandage loosely, until you are certain that all the swelling that can occur has taken place. After the first two weeks the splints should be removed at least once a week, and the finger should be flexed and extended in order to prevent anchylosis, particularly if the patient be a laboring man and beyond the middle age. If, in such cases, this precaution be neglected, anchylosis occurs in four or five weeks. Every year I am consulted by persons from the interior who have either partial or complete anchylosis of the fingers, the result of fractures of them or of the forearm; or even from whitlow, in consequence of allowing the hand to remain too long either in splints, or from neglecting to move them sufficiently often to prevent a difficulty of this character. In such cases give an anæsthetic and flex the joints by force, and then by using the hand afterwards,

it may, in a short time, become as useful as before the receipt of the injury. After the fracture has united, I generally confine the finger that was injured to one that is healthy, and direct the patient to use the hand, and that will prevent the occurrence of anchylosis.

The metacarpal bones may also be fractured. Some years ago I treated a man in whom all the metacarpal bones were fractured by striking his antagonist's head, which rested against a hogshead of sugar. The blow was so violent that something had to yield, and the bones of the cranium being more resistant than those of the hand, the latter were fractured. In such a case you should make sufficient extension and counterextension to place the extremities in apposition, and then they should be retained thus, by placing on the back of the hand a splint, which should extend from above the wrist to the extremity of the fingers. Should any difficulty be experienced in keeping the bones straight, by reason of the action of the flexor muscles of the arm, a compress of cotton should be placed both above and below, as it is never desirable to make pressure directly over the seat of the fracture, for fear of producing ulceration of the skin, for nothing promotes absorption so rapidly and certainly as pressure. You must be exceedingly careful in the management of such cases, in order to prevent deformity. The flexor muscles, being much more powerful than the extensors, have a tendency to draw the fingers and distal extremities of the metacarpal bones forward, and if this be not counteracted, an anterior curvature will result.

One of the most difficult fractures to treat is that of the lower extremity of the radius. More cases of deformity result from this than from any other fracture. It is not difficult to recognize, although it is often mistaken for dislocation of the wrist-joint. Dupuytren believed and taught that the wrist-joint was never dislocated, or, in other words, that the ulna is never dislocated without a fracture of the lower extremity of the radius. I formerly entertained the same opinion, but I recently met with a case which convinced me that a dislocation of the wrist-joint may occur without fracture, although very rarely. This accident almost always results from falling upon the hands, and takes place about an inch or an inch and a half above the wrist-joint. The position of the hand is entirely changed, being turned outward, and if the difficulty is not recognized and properly treated, a permanent deformity will result. The lower extremity of the radius may be fractured either obliquely or

transversely. The former may include only a portion of the bone, and when the styloid process only is detached it is called Barton's fracture. It frequently occurs, and from this and other oblique fractures deformity of the limb is much more liable to occur than from those of a transverse character, which are much more easily reduced and retained in a proper position until union takes place.

In fractures of the lower extremity of the radius, if a proper course be pursued, deformity may be prevented. Yet you should always take the precaution to inform the patient of the difficulties to be overcome, so that if a slight deformity should result from the injury, you may avoid censure. In this fracture always apply the pistol splint, because it is the only one with which it can be treated successfully. In such cases the hand is thrown inwards, and the lower extremity of the ulna becomes very prominent, which peculiarity, in a large proportion of the cases of this character, remains after the radius has united. The pistol splint derives its name from its outline. It should be applied to the external portion of the forearm and hand, and should be well padded and secured by a roller bandage. I frequently apply this splint upon the inner side of the arm, although I do not advise it, in consequence of the unpleasant effects which are sometimes produced by pressure made upon the median nerve, which, besides being exceedingly painful, is sometimes followed by partial paralysis of the hand. I have seen a case, during the last year, in which paralysis of the hand with anchylosis of the fingers and wrist-joint, which I think will be permanent, were produced by applying a splint upon the anterior part of the arm, without padding it sufficiently to afford the proper protection.

Simple fractures of the forearm, even when both the bones are broken, are easily managed. You can always ascertain when the fracture is reduced, and then splints should be applied sufficiently wide to prevent the approximation and bending of the radius and ulna, which would destroy the power both of pronation and supination of the hand. To render that impossible I generally apply a compress about the size of the little finger, composed of cloth, paper or even lint, upon the outer side of the arm between the bones, over which the splint should rest, and be secured by the roller bandage and three strips. The bones of the forearm may be broken at the same or different points, yet the same course of treatment should be adopted. You should be careful in such cases never

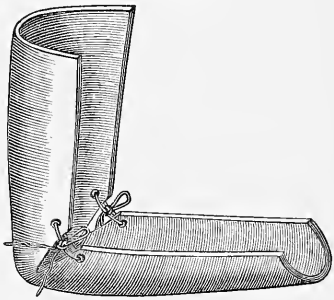
to allow the splints to extend beyond the extremity of the metacarpal bones, so that the motion of the fingers is not disturbed; then even in persons advanced in life there will be no danger of anchylosis, which frequently occurs even in simple fracture of the arm, when the splints have extended to the extremities of the fingers and have been allowed to remain too long.

When the bones of the forearm are fractured near the elbow-joint, the trough splint, made either of pasteboard, gutta-percha, or what is much better, of felt, should be applied and secured in such a manner as to keep the fragments in apposition and sufficiently at rest to secure bony union. After the third week the splint should be removed, and the arm flexed and extended so as to prevent anchylosis of the elbow-joint, which often occurs and is one of the most serious complications that could follow. When the olecranon process is fractured and complicated with dislocation, the injury is very serious, and even with the best management will sometimes be followed by anchylosis of the elbow-joint. I treated a case of this character a few weeks ago, in which after a fracture of the olecranon the forearm was kept in extension unnecessarily long after the receipt of the injury. The fracture had united, but the elbow was straight and the joint stiff, which rendered the limb almost useless. In that case I gave the patient chloroform, flexed the joint until the forearm was at a right angle with the arm, and retained it in that position for four or five days; I then flexed and extended it several times, and repeated this for three or four days until the motion of the joint was restored, and the arm as useful as before the injury. About the same time I treated a case of fracture of the coronoid process with dislocation, which I could not, after it was reduced, retain in a proper position without securing the forearm to the arm by a roller bandage, which was continued for six or eight weeks. This was one of the most difficult and annoying cases I ever treated, yet I have the satisfaction to know that the result was equally gratifying both to myself and patient.

When the olecranon process is fractured, the arm should be kept straight for three weeks, and then flexed and extended occasionally or placed in a position, if anchylosis is unavoidable, to render it useful. In fractures both of the olecranon process and the condyles or lower extremities of the humerus, the splint exhibited, Fig. 65, is the one I usually apply, because when reduced, the bones can be retained

more easily than by any other splint, and the position is the one most desirable should anchylosis result. This splint is made of felt, yet one just as useful can be made of gutta-percha or pasteboard, cut into a suitable shape. After being softened by soaking in hot water, it should be applied to the limb when in a proper position,

Fig. 65.



and secured by a roller bandage. In two or three hours either pasteboard or gutta-percha will harden so as to retain its shape, and will have sufficient strength to keep the extremities of the bones in contact. Both pasteboard and felt are cheaper than gutta-percha, and often much more serviceable, as the latter is apt to be rotten when obtained, and always soon becomes brittle or loses its elasticity by heat and expansion.

The lower extremity of the humerus is sometimes crushed or injured so that one or both of the condyles may be detached, and it is always difficult in such cases after the parts have become swollen to ascertain the extent and true character of the lesion. In such cases the extremity should be placed upon a pillow, and evaporating lotions applied until the swelling subsides, when the fracture should be reduced and the trough splint applied. The case is subsequently treated like a fracture of the olecranon. Take the precaution always to apprise the patient and his friends of the serious character of the injury, and particularly of the danger of anchylosis, and in this manner you may avoid censure; should it occur, the result would be unsatisfactory.

Fractures of the humerus may take place at any point from the condyles to the neck, and they may be either transverse or oblique. When the bone is fractured above the insertion of the latissimus dorsi and pectoralis major muscles, it is called a fracture of the

neck of the humerus; in such cases the lower fragment of the bone is drawn towards the axilla by these powerful muscles, and should their action not be overcome, deformity might result even from a fracture of that character, particularly as the supraspinatus has a tendency to draw the superior fragment outward. Three splints will usually be found necessary in the treatment of fractures of the arm, either of the shaft or neck. The external should be sufficiently long to reach from the acromion process to the elbow-joint. Before it is applied, a strip of cloth three inches wide and three yards in length should be secured by its centre to the upper extremity of the splint with three or four ordinary tacks. This splint should be applied upon the external side of the arm, and shorter splints upon the anterior and inner surfaces. After they have been secured by a roller bandage, the bandage secured to the upper extremity of the long splint should be passed to the opposite side of the body, and three strips applied as in fractures of the thigh, to remove the necessity of disturbing the dressings too frequently should the bandages become loose. By adopting this course you will never have the slightest deformity. Let the external splint extend above the upper extremity of the humerus, and if well secured it is impossible for deformity to result from this injury. After the application of the splints as directed, place the arm in a sling; it is seldom necessary for the patient to remain in a recumbent position.

Fractures of the clavicle are very common; they generally occur in the middle external third or near the acromial curvature. They may result either from direct or indirect violence. A fall upon the shoulder is a very common cause. The weight of the body being thrown upon the clavicle, it frequently yields. When this bone is fractured near the outer third, the external extremity is usually the most prominent, or rides over the internal, in consequence of the action of the supraspinatus, but when fractured near the sternum the internal fragment is usually the most prominent, in consequence of the attachment of the sterno-cleido-mastoid to that portion. The method of treatment in such cases is to bring the fractured extremities in apposition by drawing the shoulders backwards, and then to prevent displacement a compress an inch in thickness should be applied over the seat of the injury, and secured by the application of three or four long adhesive strips about an inch in width,

and applied with sufficient force to prevent displacement. Shoulder-braces or handkerchiefs arranged so as to answer the same purpose should then be applied, which can be tightened by the bandage which connects them as may be necessary. The arm should then be raised

Fig. 66.

and thrown backwards and retained in that position by a broad bandage which passes over the shoulder, and an ordinary sling to support the hand. The complicated bandages formerly in vogue were entirely useless, as it was impossible to apply them in such a manner as to fulfil the indications.

When the ribs are fractured respiration is difficult, and the patient sometimes has a troublesome cough, with bloody expectoration. I shall always recollect the first case of this character I treated. The man's name was Davis; he was both large and fat, and sustained the injury by falling upon a stone from a chaise which was upset by a careless driver. I found him breathing with great difficulty, with considerable hæmorrhage from the lungs. I recollected that Professor Dudley directed us always in such cases to apply a tight bandage so as to paralyze the action of the respiratory muscles, which I did effectually by passing his wife's apron around the chest and securing it firmly with a coarse needle and thread. In half an hour after the application of the bandage the patient was relieved, in consequence of the abdominal muscles being forced to relieve those of the chest. The hæmorrhage from the lungs soon subsided, and his recovery was both rapid and satisfactory. Should an apron not be convenient, take a strip of strong cotton cloth from twelve to sixteen inches wide, or a corset, and apply either so firmly as to approximate and retain in contact the fractured extremities of the ribs; it should be tightened as often as may be necessary to keep the injured parts entirely at rest.

Fractures of the inferior maxillary bone rarely occur either at the neck or angle, but very frequently near the chin. When this accident occurs near the centre of the bone, it is sometimes exceedingly difficult to keep the extremities both in apposition and at rest. Some recommend for that purpose a gutta-percha splint, moulded when hot into the proper shape; this I have used, but I prefer the four-tailed bandage. With it you can without difficulty keep the fragments in a proper position, and give less annoyance to the patient. After the application of the bandage, the patient should neither talk much nor take solid food, as either would have a tendency to displace the extremities of the bone and prevent union.

The bandage should be applied sufficiently tight to bring the teeth in contact, and to retain them in that position long enough for union to occur. Should it be difficult both by a compress and bandage to prevent motion, it has been recommended and practiced to fix the bone by passing a silver wire around a tooth of either fragment, and by torsion securing them together. I have seldom met with cases in which this method of treatment was necessary.

The bones of the nose are sometimes fractured, although not very

frequently. When this accident does occur the fracture can be reduced by the use of a female catheter, a piece of wood, or an ordinary director. The instrument employed should be passed into the nostrils, and sufficient force used to raise the bone into its place. In one case I treated in this city, from which considerable deformity resulted, the nasal bones were not injured. The cartilage was detached from the bone and forced backward, and in consequence of the inflammation that followed, I was not permitted to make an effort to restore it to its original and natural position. After the fracture has been reduced, cold applications should be made to the injured part, and the same treatment observed as directed in other injuries.

Fractures of the spine are always sooner or later fatal. The water-bed may prevent ulceration of the back or bed-sores, which always occur in such cases in consequence of the want of vitality. Yet the paralysis continues, and life is really not desirable under such circumstances.

LECTURE XXVI.

GENTLEMEN: To-day I shall lecture on dislocations or luxations, by which we mean the displacement of the respective surfaces of an articulation, as, for example, when the head of the humerus is dislodged from the glenoid cavity.

These injuries may be: 1st. Either partial or complete; 2d. Simple or compound. Partial dislocations seldom occur, so seldom that only a few have been recorded. Sir Astley Cooper mentions one which he saw in a shoulder-joint. In consequence of the great size of the extremities of the bones which compose the knee-joint, a partial dislocation of that articulation occurs more frequently than elsewhere. The head of the tibia may be thrown forwards, backwards, or to either side, without the articulating surfaces being entirely separated, and the dislocation is then said to be partial or incomplete. When, however, the articulating surfaces are entirely separated, it is complete.

A dislocation is simple when no external wound exists communicating with it, as, for example, when the head of the humerus is thrown downwards into the axilla, even if there is an extensive laceration of the capsular ligament. But when the soft parts, by which the bones are covered and protected, are wounded, whether the bones protrude through the wound or not, it is called a compound dislocation, and the difficulty is serious in proportion to the size of the joint, the extent of the wound, and the violence of the contusion by which it is accompanied.

Causes.—1st. The most frequent cause is external violence. 2d. The second, inordinate muscular action; and the third, disease of the articulation. Violent muscular action frequently produces dislocation of the shoulder-joint. Some years ago a young man who was suffering from epilepsy came to my office every two or three months with a dislocation of one or both humeri, in consequence of the arms being thrown upwards when the paroxysm commenced. The fits only occurred at night, and the dislocations were prevented by securing his arms to the chest by a leather strap, which he was directed

to apply every night before he retired. The third and last cause of dislocation is disease of the articulating surfaces, which produces more cases of dislocation of the hip-joint than both the preceding. When the head of the femur is destroyed by disease it escapes readily from the acetabulum, and rests upon the dorsum of the ilium; the limb is then permanently shortened, and the toes are turned inwards. Such cases are very difficult to manage in this stage; unfortunately they are very numerous in this city, in consequence of the peculiarity of the climate, much more numerous than in the Southern Atlantic States amongst the laboring classes, and they are usually neglected until they become incurable. Dislocations may be either primary or secondary. When primary they result from violence, and when secondary from muscular action, as in morbus coxarius, as already explained. I have a patient in whom I have been for several weeks trying to prevent a dislocation of the hip-joint, and now there seems to be a tendency to anchylosis, which is preferable to the shortening which usually occurs.

Symptoms.—What are the symptoms of dislocation? They are the reverse of those observed in fracture. 1st. There is immobility or fixation, while in fracture there is increased mobility, and you can change the position of the part without any difficulty; but in dislocation the bone is fixed, and generally considerable force is required to restore it to its natural position. 2d. Another symptom which generally exists is shortening, but this does not always occur. In dislocations of the shoulder-joint, unaccompanied with fracture, the arm is always elongated, the elbow does not occupy its usual position, it being difficult to bring it in contact with the chest. The space between the acromion process and the head of the humerus is greatly increased.

Deformity always exists. The amount depends upon the size of the articulating surface and the extent of the displacement. In dislocations, as well as in fractures, you should always expect swelling, generally to a degree proportionate to the amount of violence offered. Sometimes you will find the part immensely swollen, if much time has elapsed between the occurrence of the injury and the visit of the surgeon. In dislocations the limb below the seat of the lesion is almost always cold. This occurs generally in dislocations of the humerus, in consequence of the pressure made by the head of the humerus upon the nerves that supply the arm and hand, as well

as of the derangement of the circulation produced by the displacement of the bone.

There is sometimes numbness, and occasionally an entire want of sensibility in the extremity. The indication in such cases is to reduce the dislocation, or restore the articulating surfaces to their normal condition. This is accomplished by extension and counter-extension. The extension is made below the seat of the injury, and the counterextension above, either to the chest or pelvis, according to the joint concerned. Before the discovery of chloroform it was sometimes exceedingly difficult to reduce a dislocation, in consequence of the resistance offered by the muscles implicated. I always used the lancet. The patient was required to remain seated, a vein was opened, and the blood allowed to flow until syncope was threatened, which is always accompanied by so much muscular relaxation that no obstacle is presented, and the reduction becomes easy.

Some years ago, it was supposed that the shoulder-joint could not be reduced after it had been dislocated more than three months. In 1854, when I had charge of the United States Marine Hospital, in this city, the first officer of a Boston clipper was admitted, with a dislocation of the shoulder, which had existed three months and seventeen days. Malgaigne's method was adopted, and the restoration of the bone accomplished. When I was a student in Paris, there was a woman in Dupuytren's ward, in the Hôtel Dieu, who had a dislocation of the shoulder. Dupuytren failed to reduce it by the ordinary method employed in such cases, and Malgaigne obtained Dupuytren's consent to deliver a lecture to the class and attempt the reduction by a new method which he had found successful.

This consisted in securing the body by strong bandages, and when the extending apparatus was adjusted, the arm was brought gradually round until it was on a line with the body. The head of the bone was, by this procedure, removed from the axilla, and then the assistants were directed to continue the force applied, and gradually restore the bone to its natural position. Malgaigne held the humerus just below the head, but being feeble, the effort failed. It was, however, soon repeated, and Dupuytren, with his strength and skill, guided by the genius and enthusiasm of Malgaigne, succeeded perfectly.

Two years since, a man was admitted into the County Hospital, with a dislocation of the shoulder-joint, which occurred four months

and a half before, in a neighboring town. The college was in session, and, by adopting Malgaigne's method, the dislocation was reduced at the second attempt, and the arm became, after a few weeks, as useful as before.

Sometimes a dislocated shoulder can be reduced by taking hold of the hand, and with the foot placed in the axilla and the attention of the patient diverted so as not to make any resistance, more easily than by any other method, and without any assistance.

After the reduction of a dislocated shoulder, cotton should be placed in the axilla, the hand supported by a sling and the arm confined to the body for a week; then it should be released during the day and confined at night for a week or two longer.

The joint should be moved half a dozen times a day so as to restore the function as speedily as possible, otherwise anchylosis might occur, which would destroy the value of the reduction. Although in dislocations of the shoulder-joint the head of the bone is thrown inward, downward, or outward, and the cavity is empty and nothing can be felt except the stretched fibres of the deltoid muscles, yet many physicians mistake a dislocation of the shoulder-joint for a contusion, and treat it accordingly until the reduction is difficult and sometimes impossible.

Such a mistake I regard as inexcusable. The symptoms are so decided that any man who has intellect enough to make a respectable physician should be able by a glance to detect the difficulty.

Occasionally in cases of dislocation of the humerus of long standing the axillary artery is lacerated by the force required to restore the bone to its natural position; and the fact of this risk should be communicated to the patient before the effort is made, for self-protection.

Dislocation of the elbow-joint occasionally occurs, and is sometimes, even by physicians, mistaken for fracture. When the elbow-joint is dislocated, the olecranon process of the ulna is thrown backward and upward, the forearm is fixed or almost immovable, the arm is shortened, and the function of the joint is destroyed. This displacement is easily recognized and can be speedily replaced. To recapitulate, in dislocation of the elbow-joint the olecranon is very prominent. The arm cannot be flexed without great pain; it is diminished in length and can be reduced more easily than any

other dislocation of an important joint, unless it has been neglected, and then after the expiration of six weeks it is regarded by Professor Gross, who is the highest authority, and others as impossible. An assistant is seldom necessary to enable you to reduce a dislocation of the elbow-joint. If you have an assistant, he should take hold of the arm and hold it firmly, until the extending force is sufficient to reduce the dislocation. Occasionally in dislocations of the elbow-joint, if the coronoid process is fractured it becomes difficult and sometimes impossible to prevent a recurrence of the displacement. Three or four years since I treated a patient from Sonoma County, who had a dislocation of the elbow-joint with a fracture of the coronoid process of the ulna. I reduced the dislocation, but was unable to prevent its recurrence by the ordinary treatment, and was finally compelled to secure the forearm to the arm with a bandage, and keep it thus bound until the ligament united and became sufficiently strong to overcome that tendency.

A simple dislocation of the elbow-joint seldom gives rise to serious consequences. Sometimes, however, and particularly when a strumous diathesis exists, inflammation may follow either a dislocation or contusion, and then great difficulty will be experienced to prevent anchylosis. The forearm should be flexed and extended every two or three days, and if anchylosis must occur, the forearm should be bent so as to form an angle with the arm, and retained in that position until the motion is destroyed. Dupuytren believed that the wrist-joint was never dislocated without a fracture of the radius, and for many years I entertained the same opinion, until I met with a case of dislocation of the wrist without a fracture. Reduce the dislocation, apply a pistol-splint and keep it on until the ligaments unite, otherwise you will have as much deformity as would result from an improper treatment of a fracture of the radius, complicated with a dislocation of the lower extremity of the ulna.

The most difficult dislocation of the superior extremity to reduce is that of the metacarpal bone of the thumb. I have treated two cases in this city, and succeeded in reducing both. The first had resisted the efforts of the best physicians in the city for several days. I gave chloroform, the end of the thumb was secured by a clove-hitch, and by extension and counterextension the joint was reduced without dividing the flexor muscles of the thumb, as recommended and practiced by our ablest surgeons.

The fingers may be dislocated in any direction, and are easily reduced, and should be kept for a few days immovable by the application of splints composed of blotting-paper or pasteboard. The more simple the dressing the better; the bandages should not be sufficiently tight to produce pain, and then you will not have any difficulty after the dislocation is reduced.

The condyles or articulating surfaces of the inferior maxillary bone are often dislocated. The patient is then unable to close his mouth. A negro man came to my office some months since for the first time, with his mouth open and unable to speak. I found upon making an examination that both of the condyles were thrown in front of the zygomatic processes.

It is, although a very distressing accident, a very simple one, and reduction is generally easy. The thumbs being protected by a towel or handkerchief should be placed upon the posterior molar teeth, and while they are pressed downward and backward the chin should be elevated with the fingers of both hands, by which manœuvre the bone will generally slip back into its place. Sometimes, however, after this accident has once happened, it is very liable to recur, in consequence of relaxation of the ligaments, and then it becomes necessary for the patient to have the lower jaw secured at night by a bandage, to prevent the mouth from being widely opened.

Dislocations of the clavicle, although not very frequent, occasionally occur. Since the commencement of this course of lectures you have seen a case of dislocation of the acromial end of the clavicle; the ligaments yielded and the extremity of the bone was displaced. Dislocations of this bone are much more common than I at one time supposed. When sufficient force is applied to the shoulder the clavicle generally breaks about the external third, but when the bone is stronger than the ligament, instead of a fracture we find a dislocation.

After reducing a dislocation of either the sternal or acromial end of the clavicle, you will find that your troubles have only commenced. I have after many years of experience, and after being disappointed by the bandages recommended, discarded them entirely, and now rely upon a compress and adhesive plaster. And, gentlemen, I can say that the only cases I have ever treated successfully and satisfactorily, both to myself and the patient, were treated by this method. A compress of lint should be applied; the

shoulders are then to be drawn back by an assistant, and strips of adhesive plaster half an inch wide applied as firmly as possible. They should extend eight or ten inches below the clavicle on each side, and be allowed to remain as long as they adhere closely and firmly to the skin. The arm should be supported by a sling. And I now do not feel any uneasiness in reference to the result of a dislocation of the clavicle treated by this method.

LECTURE XXVII.

I WILL direct your attention this morning to dislocations of the hip-joint, a lesion which occasionally occurs, and which is always serious. Although I have practiced more than thirty years, I have only treated two cases of this character. One occurred in South Carolina and the other in California. The former was a female servant, about twenty-five years old. She fell from a hay wagon, about five yards, struck upon her feet, and dislocated the left hip-joint. The head of the femur was thrown upward and outward, resting upon the dorsum of the ilium, and the limb was shortened about three inches. In the case which occurred in California, the limb was elongated in consequence of the dislocation being downward, which resulted from a fall upon the side on shipboard.

This joint may be dislocated in four directions. The first and most frequent is upward and backward, upon the dorsum of the ilium, the force being applied to the feet when the extremities are extended. The round ligament is lacerated, and the head of the bone occupies the position before indicated. The toes, in this dislocation, always turn inward. There exists considerable immobility, and the amount of shortening already specified. In fracture of the neck of the thigh-bone there is perfect mobility, the foot always turns outward, unless the head of the bone is forced up under the glutei muscles. A case of this character was given when fractures were under consideration.

2d. In the second form of dislocation of the hip-joint, the head of the femur is thrown backward into the sacro-ischiatic notch, the extremity is not much shortened, and the position of the toes but little changed.

3d. The head of the femur is thrown downward into the foramen ovale; then the limb is elongated, probably more than an inch, and the toes are turned inward, and remain fixed in that position. I met with a case of this character, in the San Francisco County Hospital, which has already been mentioned.

4th. The head of the femur may be forced upward upon the pubis, when there will be but little, if any, shortening, and the toes turn outward.

To recapitulate, in the first, which is the most common, the head of the bone is thrown upward and backward. 2d. Backward and downward into the sacro-ischiatic notch, accompanied with very little shortening or change of position. 3d. Downward and forward into the foramen ovale, with elongation and inversion of the toes. 4th. Forward upon the pubis, with eversion of the toes, with an inability to move the limbs.

The indication, in every variety of dislocation of the hip-joint, is to restore the head of the bone to its natural position, and this can be accomplished only by making extension and counterextension, and, at the same time, adopting such means as are calculated to facilitate the passage of the head of the bone from its unnatural position into the acetabulum. Before the discovery of anæsthetics, and when the physician was too timid to bleed, so as to produce muscular relaxation, pulleys were often employed, and sometimes successfully, but often the result was not satisfactory.

Twenty-five years ago I was called to see a strong colored man who had a dislocation of the shoulder. The physician of the family being sent for, he fixed the body of the man to a large oak tree in the yard by a sheet. Bandages were applied to the forearm, and five strong men were directed to use all the power they could command; yet every effort was ineffectual. Late in the afternoon I was requested to see the patient, who lived five miles from the city. I found him fastened to the tree, complaining of great soreness of the shoulder, and very much exhausted by the repeated but unsuccessful efforts made by brute force to reduce the arm. I removed the bandages from the arm and opened a vein. The blood flowed in a free stream, and very soon syncope was threatened. The flow of blood was then arrested; I took hold of the arm, a strong man grasped the wrist, and, with my assistance, the head of the bone slipped into the socket, to the astonishment of every person present, and to the discomfiture of the physician. When a patient is under the influence of chloroform but little force is needed, consequently the accidents resulting from efforts to reduce dislocations occur much less frequently than formerly. With moderate extension and counter-

extension, and the proper direction of the head of the bone, any dislocation can be reduced without much difficulty.

Knee-joint.—Dislocations of the knee-joint, in consequence of the great extent of the articulating surfaces, are very uncommon, but when they do occur they are always serious, and, if compound, exceedingly dangerous. I have practiced a long time, and have only met with one case of dislocation of the knee-joint. It was produced by the patient falling down a flight of stairs. The subject was a female about forty years old. The dislocation was posterior and complete, and was reduced very easily by the assistance of the husband. A splint was applied for the purpose of preventing a recurrence of the lesion. It was removed after seven days, and reapplied after flexing and extending the limb, which is considered very important in all cases of this character. During the time I was in the hospitals of Paris not a single case of this character was admitted. This dislocation may occur, and present four varieties. In the first the condyles of the femur are thrown forward. In the second backward, and the tibia becomes very prominent. In the third and fourth varieties the dislocation is lateral. I think partial dislocations of the knee-joint are much more common and much less dangerous.

In consequence of the size of the bones which compose the knee-joint, and the slight protection afforded by the surrounding parts, compound luxations are much more dangerous than simple. Even if considerable swelling exists, this dislocation is seldom mistaken for any other accident, even by the most inexperienced practitioners. The joint is immovable, unless by considerable effort, there is always pain, and when the dislocation is complete there is both shortening and marked deformity, which cannot be mistaken. The ligaments, in such cases, are all lacerated, and after the administration of chloroform but little difficulty will be experienced in restoring the relation of the bones. Inflammation may follow in a simple case, but in the compound it is very seldom that the leg is saved, and when it is anchylosis almost always results. Except under the most favorable circumstances, amputation should be recommended, and the time that should be allowed to elapse after the injury must depend on the condition of the patient.

Dislocations of the ankle may occur in four directions,—inward, outward, backward, and forward. With the position of the bones of the leg and the astragalus you are all familiar. The tibia rests upon

the astragalus above, and protects it on the inner side, and the fibula performs the same office externally. In lateral dislocations of the ankle-joint there is always a fracture either of the tibia or fibula, and the fracture and the dislocation may be either simple or compound. To illustrate, I will describe a very remarkable case which occurred in this city. It was remarkable both for the extent of the injury as well as the result. One of our most distinguished United States Senators was thrown from a buggy and severely injured. The tibia of the right leg was fractured near the ankle, the fibula was dislocated and protruded through a wound more than three inches long. The foot was turned inward, and fixed by the position of the fibula. When I arrived I found other physicians present, and, when the boot was removed, they thought that amputation should be performed at once, as they believed that it afforded the only chance for life. The dislocated and fractured bones were reduced, the limb was placed on a double inclined plane, morphia was administered to relieve pain, irrigation was continued for ten days, until the danger from inflammation had passed, and then the warm-water dressing was applied, and continued until the wound healed. He left his room well, with perfect motion of the joint, in forty-two days after the occurrence of the accident, to attend to some business in Sacramento City, in this State. The ankle-joint may be dislocated either forward or backward without a fracture of either of the bones of the leg. No difficulty is generally experienced in reducing a dislocation of the ankle-joint.

The astragalus may be dislocated as well as the bones of the leg, which, with it, form the ankle-joint. Some years since, a stage contractor, named McClain, jumped from the driver's seat of a stage when the horses were running at full speed. He sustained a compound dislocation, and the astragalus protruded through the external wound. This accident occurred more than twenty-five years ago, and, consequently, I could not refer to any author for guidance as to the treatment in such cases. We had a consultation, and I was in the minority.

All the physicians present thought that amputation was indispensable. McClain consented, provided I thought it necessary. I removed the astragalus, closed the wound partially, applied cold water, with a splint well padded on the inside of the limb. The extremity was saved; it was about an inch shorter than the other leg; there was

considerable motion in the joint. It was one of my triumphs and was called Toland's luck in surgery. Should the astragalus be dislocated without an external wound, and reduction be found to be impossible, an incision should be made, the bone removed and the case treated as already indicated. Never allow a patient, either after a surgical operation or an injury, to suffer pain. *Ubi irritatio ibi flaxus* is unquestionably true, and the surgeon who ignores the adage never will be successful.

The metatarsal bones are seldom dislocated without being fractured also; the injury is generally produced by a heavy weight falling upon the foot. A man has recently been admitted into the surgical ward of the hospital with a dislocation of the metatarsal bones, without a fracture, but such cases are exceedingly rare, and when they do occur, it is only necessary to place the bones in their normal position and apply a well-padded splint to the sole of the foot, and keep it on until the ligaments have become sufficiently strong to retain the bones in their natural position.

The toes are frequently dislocated, but very little difficulty is experienced in reducing them, except it be in the case of the first joint of the great toe. I found a case of that character in the County Hospital in 1853. The patient was a strong young Englishman, who had fallen through a scuttle, and had dislocated the first joint of the great toe. Jarvis's adjuster was applied and the bone was replaced in a few minutes. This dislocation is about as difficult to reduce as a dislocation of the second joint of the thumb. You might suppose that it would be very easy to pull either the thumb or toe off entirely, but after you have treated two such cases as those I have described you will arrive at a different conclusion. The flexor muscles of the thumb and great toe are so strong that without the influence of an anæsthetic the reduction would be very difficult, if not impossible.

False Joints.—Having omitted the consideration of this subject in my lecture on fractures, I beg leave now to refer to it. It is very important; so important that every practitioner should be familiar with the best method of treating it in every variety, or, in other words, in every location.

A false joint may occur in a long bone at any point between the articulating surfaces, and when in the centre an operation is less difficult than near the extremities.

After a fracture, sometimes bony union fails to take place; the ends are covered by a fibrous or ligamentous tissue which extends from one extremity to the other, and does not become ossified. In other cases the connection resembles the ball and socket-joint, and without proper treatment it cannot be cured.

Treatment.—Three methods have been adopted for the purpose of effecting union when a false joint does really exist. Dr. Physick recommended that the extremities should be rubbed forcibly together; that irritants should be applied, and the patient allowed to take active exercise; should this fail he recommended that a seton be passed between the ends of the bone and allowed to remain until a considerable degree of inflammation is produced, when the seton should be removed and the case treated like one of recent fracture. Professor Brainard, in order to fulfil the same indication, passed ivory pins between the ends of the bones, and allowed them to remain until the desired effect was obtained. He thought they were superior to the seton, because the external wound which resulted was less extensive, and consequently healed more readily. When friction, the seton, or ivory pins all fail, the only alternative left is to resect, or in other words remove with a chain-saw the extremities of the fractured bone, drill a hole in each, pass a strong silver wire through the opening, bring the extremities together, make three turns to the right, and then make a memorandum and keep it so that you may not have any trouble in removing the wire when its presence should be dispensed with. In the first operation of this kind which I performed, I experienced more difficulty in removing than in inserting the wire, but if this precaution be taken it obviates the only difficulty in such cases. It is not difficult to perform these operations, but you should always weigh carefully the probabilities as to the result. I have resected the thigh-bone three times; two recovered, and the third died in the County Hospital seven days after the operation, in a typhoid state which was produced either from the dread of, or the shock resulting from, the operation. I have resected the arm, the forearm, and the leg successfully, and although I have only lost one case from an operation of this character upon the thigh, I regard it as one of very serious importance, and one which should not be performed until every other treatment has failed. I have never resected the bones of the leg in ununited fracture but once. In that case the bones overrode one another at

least two inches, and from the length of time that had elapsed I was convinced that the operation afforded the only chance for relief. The gentleman was from Placerville, and the operation was performed at St. Mary's Hospital, in this city. A case of ununited fracture has never occurred in my practice; in every case of the kind in the leg which I have treated, if the ends of the bone touch, I have never failed to effect a solid union, and I am happy to say that by my advice and attention I have saved several of my confreres from suits for malpractice. Should a fractured arm, forearm, or leg fail to unite in six weeks, a starch bandage should be applied with one splint for support, and the patient directed to exercise the limb as much as possible. Should it become very painful, rest should be enjoined until the inflammation partially subsides, and then the exercise should be resumed. The members of this and every other class who have followed me in the County Hospital, can substantiate the truth of the statement I have made.

In resections of the thigh-bone the incisions, if possible, should be made upon the outside of the limb, so as not only to avoid the vessels and nerves, but also to provide for drainage; which, I think, in treating all wounds, is of more importance than everything else connected with such cases. If the incision be made upon the external side of the limb, the wound will find ready drainage. In a patient with a good constitution and unimpaired general health the operation is justifiable, yet the physician should never persuade a patient by misrepresentation to submit to this or any other operation, except under the circumstances already specified.

LECTURE XXVIII.

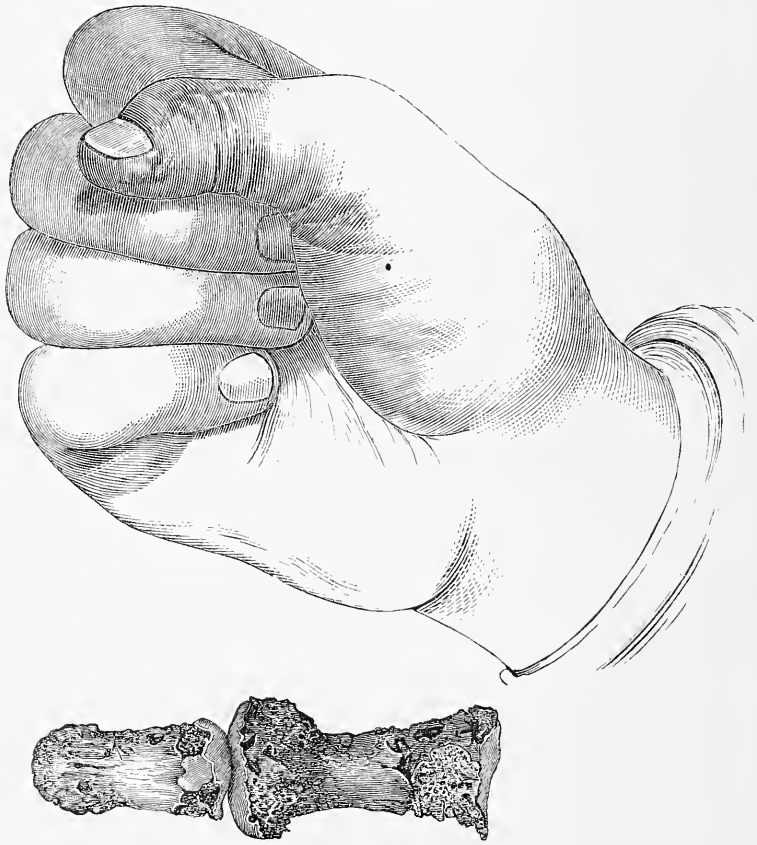
GENTLEMEN: In this lecture I will endeavor to describe the diseases of the bones. A bone in its natural and healthy condition is almost entirely devoid of sensibility. But when either the bone or its covering, the periosteum, becomes inflamed, the pain is exceedingly acute, greater than that experienced in any other disease, except inflammation of the ear, the parotid gland, the frontal sinus, and the nerves of the teeth.

The inflammation may be confined to the periosteum, or may extend to the bone, and then both tissues are implicated at the same time. In a healthy bone the vessels are not visible, but when inflamed they become distended with blood, as do also many which were impervious before the bone became inflamed. This inflammation is more intense in spots, which produces irregularity in the redness of the part. In some cases the entire periosteum of one or more of the phalanges of the fingers becomes implicated, and if not properly treated is detached and separated from the bone, which loses its vitality, becomes an extraneous body, and if removed when the separation of the periosteum is complete another bone or bones will form, with the intervening joints, which will be as useful as the original. And for more than twenty years a knowledge of the reproduction of bones, joints, and ligaments has saved more limbs and prevented more cases of deformity than any discovery that has been made during the last quarter of a century. Professor Benjamin Dudley, my old teacher, was aware of the reproduction of the first joint of the thumb and fingers, but I first demonstrated, in San Francisco, that entire fingers and joints can be reproduced and become as useful as before they were diseased. These are not the only bones that are reproduced, as will appear before the consideration of this subject is completed.

When the periosteum is inflamed to a limited extent, pus forms between that membrane and the bone, the membrane is detached, the pus escapes by ulceration, and the external surface of the bone being

deprived of vitality exfoliates, or, in other words, is detached from the healthy bone, and escapes or is removed through the opening produced by the escape of the purulent matter. When the entire periosteum of a bone is inflamed, as already stated, the formation of matter separates it from the bone, which is called necrosis, and if a

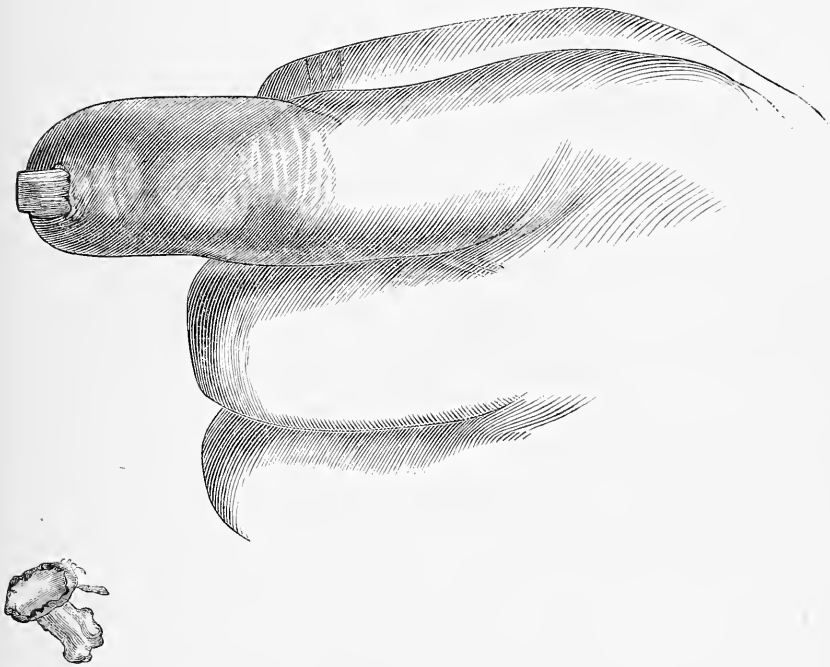
Fig. 67.



new bone is formed over the necrosed bone, the latter is called a sequestrum. Many limbs have been removed because portions of necrosed bones were included in the cavity of one newly formed by the detached periosteum, because it was generally supposed that when a bone is diseased it cannot again become healthy. Frequently the

new bone forms upon one side of the original bone, and is entirely separated from it, and can be removed without interfering at all with that which has been reproduced. I operated upon a case of this character a few years since, which occurred in the southern part of the State, with entire success, as well as upon the tibia of a young man from Oregon which presented the same peculiarity. This oper-

Fig. 68.



ation was performed before the class in 1863, and he visited the amphitheatre daily until he was entirely well. In 1853 I amputated the arm of a miner at the shoulder-joint, in a case of that character, in the City and County Hospital, and I now will only say that if I had that case to treat again, although the entire bone was diseased, I would not amputate, but would remove all the dead bone and probably save the arm.

When a sequestrum cannot be removed from the opening formed for the purpose of allowing the purulent secretion to escape, the orifice should be enlarged either with a trephine or chisel. It should

be large enough to admit the introduction of dressing forceps, which are more convenient than even toothed forceps for that purpose. I operated, some years since, upon a boy, who lived on Fulton Street, in Hays Valley, who injured his ankle by jumping from a street car when in motion. The ankle-joint inflamed, was excessively painful, the periosteum was detached, and the articulating surfaces were diseased. His physician called a consultation, and they decided that the foot could not be saved and that amputation of the limb was necessary. Dr. Sawyer was one of the consulting physicians. His mother objected, sent for me the next morning, and in a few days I removed three inches of the lower extremity of the tibia, the extremity of the fibula, and the astragalus, with the trephine, the gouge, chisel, and toothed forceps. In a month new bone had formed, he began to take exercise, and now his leg, ankle, and foot are healthy, and the only inconvenience he experiences is from anchylosis of the joint. He is an engineer by profession, and finds very little inconvenience from an injury which one of our most prominent surgeons thought sufficiently serious to require amputation.

We will now consider how these cases should be treated. Inflammation almost always commences in the periosteum; the pain is acute, and whether the bone be small or large an incision should be made sufficiently deep to divide the periosteum, which will prevent the formation of pus under that membrane, and consequently the death of the bone. A distinguished man of this city had an injury of the tibia, and the bone, or rather the periosteum, was inflamed. I made a free incision; the pain ceased so soon as the periosteum was divided, and suppuration was prevented, except what must necessarily result from the division of the integuments. The wound healed, and he has never experienced the slightest inconvenience from the injury or its consequences for ten or fifteen years.

In all cases of periostitis, if it be possible to reach the bone, an incision should be made so soon as the character of the trouble can be positively ascertained. In 1870 a gentleman from Gold Hill came to this city with violent pain in the mastoid process, which resisted the ordinary treatment, leeches, blisters, and narcotics, which I prescribed without relief for several days. I then made an incision, which extended to the bone, which afforded immediate relief. The external wound was kept from healing, and in fifteen or twenty

days several small pieces of bone escaped. The wound then healed, and the patient has been quite well ever since. Recently, in this city, a lad, about twelve years old, fell upon his side, and soon afterwards suffered violent pain in the trochanter major. Milder treatment having failed to relieve this, I made an incision through the skin, cellular tissue, and periosteum. The operation afforded immediate relief; in the course of three weeks several small pieces of bone escaped, and the young man is now well. If this case had not been properly treated this patient might have been rendered a permanent cripple.

When a bone is diseased and not necrosed it is called caries. This difficulty is not uncommon, and almost always attacks the extremities of long bones, the shaft being rarely affected. It is almost always of a scrofulous character, and can be distinguished from tertiary syphilis by the location, the latter always attacking the superficial bones, and the pain being more severe at night. Do not confound the words necrosis and caries; the former means a dead bone, the latter a diseased bone, which may be produced by a deposition of tuberculous matter in the parenchymatous structure of the bone. Inflammation soon follows, pus of a very unhealthy character is secreted, and when the integument yields to the pressure you will find diseased bone but not a sequestrum.

Inflammation of the cancellated structure of a bone may result from violence, and if not located so that an incision can be made without wounding the capsule of the joint, it must be treated by the ordinary method. In such cases, after the abscess breaks or is opened, the abscess rarely, and I think I may say that it never, can heal until the diseased bone is removed.

Fig. 69 (p. 314) represents the foot of a little girl, about twelve years of age, who had, nine years previously, a scrofulous affection of the ankle. Her father died of consumption. A few months afterwards the operation was performed in the presence of several members of the class, who were then attending lectures in the medical college. She had great pain in the ankle, with a profuse discharge from each side, and was very feeble. I gave her quinine with stimulants, until her general health was improved, and then I made an incision over the tibia about three inches long, and extending to the ankle-joint. Finding the bone enlarged, I applied a small trephine at the upper extremity of the wound, and then, with a gouge

and mallet, the entire extremity of the tibia was removed, but the periosteum was preserved.

Fig. 69.

From this operation she recovered rapidly, and in four or five weeks I made an incision upon the external side of the ankle-joint, and removed with a chain-saw the lower extremity of the fibula, and all the bones of the ankle-joint with a pair of tooth forceps. She recovered rapidly, has perfect use of the joint, is as active as ordinary children of her age, and for several years did not require any support, but recently she complained that the injured foot was weaker

than the other. I supplied her with a support, which she will use until she is fully matured. This case was presented at a meeting of the State Medical Society, in San Francisco, but not until ten years had elapsed after the performance of the operation. Bones have been reproduced in this case,—three inches of the tibia, one inch and a half of the fibula, with all the bones of the ankle-joint; and now the limb is very little shortened; the motion of the joint is perfect, consequently the articulating surfaces and ligaments must also exist, otherwise there could neither be strength nor useful motion. A few months after this operation was performed I removed at my private hospital the entire ulna for necrosis, with the most satisfactory result. The patient was from Benicia, was about thirteen years old, and made as rapid and satisfactory recovery as any patient I have ever treated for a similar difficulty.

I operated upon Mrs. Bruze, a clergyman's wife, from Coloma, for caries of the ankle-joint which involved the bones of the leg. Her weight, when she came to San Francisco, was seventy-five pounds. Not only the lower extremities of the tibia and fibula were removed, but also all the bones of the ankle-joint, and to the astonishment of all her friends she has so far recovered as not to require even a cane, and is able to attend to all her domestic duties without any inconvenience. I will not trespass upon your time by giving other cases, but I want you distinctly to understand that when you can remove all the dead bone either from a joint or the shaft of a bone, it is much more safe and the result is always more satisfactory than an amputation.

You will read of subperiosteal resections of bones. No man can dissect the periosteum from a healthy elbow-joint, and resect the joint after the periosteum has been removed, and in every case the operation has proved a failure. No man can remove the periosteum so well and so effectually as inflammation does, consequently in diseases of the bones, if the primary treatment does not succeed, then I beg leave to recommend patience. Wait until the periosteum separates from the bone, then the diseased bone can be removed. A new bone will be formed by the periosteum, which may be as useful as the original. I wish you to distinctly understand that a bone covered by the periosteum should not, under any circumstances, be removed, and I am convinced from observation that whenever resections have been attempted in such cases they have proved to be failures.

Subcutaneous resections of bones are very fashionable, but unless the term refers to bones denuded by disease, I have no confidence in the success of such operations. Should an articulation be diseased without the bone being implicated, then open the joint, remove the articulating surfaces, and treat the case according to the directions already given for the management in ordinary cases of resection. Do not disturb the periosteum of a healthy bone, and never resect anything except the articulating surfaces. In a matter of so much importance repetition I think is excusable. Tubercles may form in any portion of the body, and the cancellated portion of long bones is liable to this occurrence. Sometimes the presence of tubercles produces inflammation. Purulent matter is secreted, and not finding an exit the bone expands, becomes occasionally enormously enlarged, and a condition results which was formerly called spina ventosa. The bone becomes diseased, generally from an injury, the periosteum separates, a new bone is formed, and in consequence of the pressure of the contained fluid becomes greatly enlarged.

I treated a case of this character at the Franklin House, on Broadway, a few years ago. The lower extremity of the thigh-bone was enormously enlarged. The articulation not being involved, I applied the trephine, which allowed more than a quart of pus to escape, used the warm-water dressing with a tight bandage, and was greatly pleased to hear, two or three years subsequently, that the boy had entirely recovered, the enlargement having disappeared. Occasionally pus forms in the interior of a bone, and remains many years without producing any external evidence of disease, but is accompanied with the most excruciating pain. The most remarkable case of this character that I have treated came from Oregon. He was a German, aged about forty years. His father was a farrier, and one afternoon when he and some other boys were amusing themselves by sliding down the side of a pile of straw, it so happened that instead of his coming in contact with straw, he struck upon the ground with some force. From that time he had pain in the tibia of the right leg. The pain occasionally became excessive, then he was confined to bed, blisters were applied and anodynes administered, which afforded only temporary relief. After making a careful examination of his case, I was in doubt as to its true character. The superficial nerves of the leg were divided without relief. I then came to the conclusion that the cause was in the centre of the bone,

and accordingly applied the trephine, when to my gratification and his immediate relief more than a teaspoonful of pus escaped. That collision had probably existed more than twenty years, and yet had not produced the slightest enlargement of the bone. This case was published at the time, in the *Pacific Medical Journal*, with all the necessary details.

Exostosis means an unnatural growth of a bone. It may be solid, hollow, or formed of radiating plates. Sometimes an exostosis is excessively hard, particularly in tertiary syphilis, when it is as firm as ivory and is said to be eburnated. Sometimes the enlargement rises abruptly, and then it is called a node, which is the form generally presented in specific affections of the periosteum. After the inflammation has existed for some time, an indistinct fluctuation is discovered, and if an opening be made, a thin yellow matter escapes which can scarcely be called purulent. This is generally followed by an exfoliation of the bone, to which our attention will be directed when I lecture upon that subject. Exostoses may occur from other causes. They are often found upon the shaft of a bone, particularly in the humerus and femur; they give no pain, are not tender to the touch, and very often the patient does not know how long they have existed. They are not dangerous, and can be removed either with a gouge or chisel, or, if in a favorable location, with a chain-saw.

When situated either in the medullary or cancellated structure of a bone, they are usually called osteosarcoma, and are divided into fibrous and medullary. They occur frequently in the bones of the face, and particularly in the superior and inferior maxillary bones. It is not necessary to repeat what was said upon this subject when lecturing on tumors. Encephaloid or malignant cancer frequently affects the bones of young persons, and is always fatal. Your attention has also been directed to this disease. Rickets is a disease of the bones to which I have not alluded. In this affection the bones are soft, resembling leather rather than bone. If you pass a saw either transversely or perpendicularly through such a bone, the surface exposed is red instead of white. The bone can be bent in any direction, and when fractured it yields no crepitation, but if the limb be examined in a few days afterwards, you will find at the point injured an enlargement. The bone was bent at that point, but there was no displacement. There are two families in this city

that I have attended for the last twenty years, and all the first children had rickets with bent legs and easily injured bones. This continued until I ascertained the cause. After this the children were not allowed to take any except coarse food, which contained a sufficient amount of the phosphates, and was taken into the stomach to render the bones solid. Give corn-meal, sweet potatoes, oatmeal, cracked wheat, or brown bread with beef, and this disease will disappear in a very short time. If this course of treating children was generally adopted, the human race would improve rapidly, both physically and mentally, and very soon bow legs and hunchbacks would disappear.

Mollities ossium is a disease in which the bones are easily bent, but do not contain lime enough to actually break. This disease is confined to adults, and I am truly glad to say to you that I have practiced medicine over thirty years without meeting with a case of this character. I hope you will not misunderstand me. I am glad to know that the disease occurs so seldom. Yet if a case should occur in this city I would appreciate highly the privilege of examining it, so as to determine if possible the true cause and character of the difficulty. Such patients generally suffer excessively, and require narcotics to obtain relief. I think from the experience of other competent men, that this disease is incurable. Yet you should do everything possible to render your patient comfortable, and endeavor to ascertain the cause of the disease by examining the excretions, as well as obtaining a knowledge of his habits.

LECTURE XXIX.

GENTLEMEN: Diseases of the spine may result from either one of two morbid conditions, the symptoms of which it is exceedingly important for you to recognize. The first is preceded by a deposition of crude tuberculous matter, the presence of which, in the cancellated structure of the bones, always produces inflammation; as the result of this the vertebræ become carious, their anterior, lateral, or posterior portions are absorbed, and in this way the vertebral column is weakened. If the vertebral column has been divided perpendicularly by a saw, we observe a deficiency in the anterior portion, for example, of the bodies of the bones, and whenever this condition exists, what remains of the bones will come in contact and a posterior curvature must result. Suppose the caries should occur laterally, then the body will be curved in the opposite direction, which is called a lateral curvature. The spine may curve to either side, anteriorly or posteriorly, according to the portion of the body of the vertebræ that may be destroyed. This is an exceedingly important and difficult disease to treat, and its symptoms differ entirely from those of the simple form.

The patient generally has fever, complains of pain in the back, and is unwilling to take much exercise. Often these symptoms are accompanied with numbness of the lower extremities, and sometimes with paralysis. After this condition has continued for a time, the curvature will become apparent, and sometimes a fluctuating tumor will be detected, and the pain is temporarily diminished. This tumor may appear near the curvature, at the groin, or above the knee; when near the spine it is called a spinal or lumbar abscess, when at the groin a psoas abscess, because the pus passes down the sheath of the psoas magnus muscle, until it reaches that point, but occasionally it passes under the fascia lata until it reaches the knee.

Be careful not to make an opening so soon as you discover fluctuation. The abscess is an evidence of organic disease of the bone, and should not be opened as long as it can possibly be avoided. I saw

Lisfranc, in the Hospital of La Pitié, open a psoas abscess, and then apply twenty leeches about the opening—the most effectual method that could be adopted to destroy the patient. In this city some physicians insert a drainage-tube, but I must say that my experience forbids any interference. So long as the air is excluded from the cavity of the abscess, there is but little fever, the patient is comfortable, has a good appetite, and some chance remains for his recovery.

In Dupuytren's ward, in the Hôtel Dieu, in Paris, I saw two cases treated and relieved by counterirritation and constitutional treatment. The moxa was applied repeatedly; the abscess disappeared, but I am not positive that the cure was permanent. When a psoas abscess has been opened, I have never known a patient to recover, although they sometimes linger for several years before they are completely exhausted by the drain. When, however, the skin covering an abscess becomes inflamed, and ulceration is threatened, an opening should be made to relieve the distension. I think the method adopted when I was a student greatly preferable to a free incision. A valvular opening was made, and after the escape of the pus the incision was closed by the first intention, and the operation repeated when necessary. In caries of the spine with curvature, great benefit will result from the use of a properly adjusted apparatus, calculated to relieve the spine from the weight of the upper part of the body, and prevent the increase of the deformity. Such machines are now made in this city quite as well as in any other portion of the United States. Tonics should be prescribed, generous diet allowed, and indeed every means employed to increase the strength of the patient. Cod-liver oil is a favorite remedy with many members of the profession in such cases, but I must say that I have always been disappointed when it was prescribed. Blancard's pills are very valuable, and I have long thought the opinion of Trousseau (who was one of my teachers when in Paris), that the preparations of iron favored the development of tubercles, was wanting in proof.

In curvature of the spine produced by rickets or by general constitutional and local debility, we may by proper management prevent the deformity from increasing, and sometimes cure it after it has occurred. A suitable apparatus should be applied, particularly during exercise. If it is disagreeable to the patient, the instrument may be removed from time to time, and then the horizontal posture

should be enforced. I have cured some very bad cases by combining rest, exercise, and proper diet. There are now in this city two young ladies in fine health, who were cured without an apparatus, by exercising with weight and pulley, and spending the balance of the day on a lounge, with a pillow under the prominent portion of the spine. This plan I adopted about twenty-five years ago, and have not failed in a single case in which the patient was old enough to appreciate the necessity of perseverance.

In the two cases above alluded to the curvature was lateral, and only three months' treatment was required to effect a radical cure. In a posterior curvature of this character it is not necessary to deprive the patient of liberty. Apply a suitable apparatus; allow them to take exercise, to go to school, and feed and clothe them properly, and in almost every case the curvature will disappear. Sulphate of quinine, with the fluid extract of senna, has produced a more decided tonic effect in such cases than any other combination I have ever made. In such cases specialists rely too much upon apparatus. A practitioner of this kind visited this city a few years ago, but I do not think he increased his reputation by his visit.

There was a little boy here, two or three years old, who was doing exceedingly well under judicious treatment. This man applied an apparatus which the poor little fellow could not carry. His health after the machine was applied failed daily, until it was removed and the former treatment resumed, and he is now well. If there is any character I abominate, it is one of these machine specialists who has not brains enough to become familiar with every branch of the profession. He may devote his attention to orthopedic surgery without ever having treated a patient.

I have already described the treatment of rickets, and need not therefore speak further upon this subject, except to say, give food that increases the formation of the phosphate of lime in the blood, without which the disease cannot be cured. In cases of curvature of the spine it is much better for a patient to walk than to remain long in a sitting posture, with all the muscles relaxed and the weight falling upon the spine.

When children are disposed to curvatures of the spine, in consequence of being confined too long in school, or being allowed to sleep with the head too high, the cause should be removed, tonics administered, and the proper diet prescribed to increase the

strength of the bones. There is nothing so injurious in such cases as the ordinary shoulder-brace. The shoulders are drawn back, but the position of the spine remains the same. The muscles become weakened by inaction. Nor do I believe in such cases in making extension or counterextension. This treatment is very distressing, and I have yet to meet with the first case in which great deformity existed that has been entirely cured. Such cases should be attended to early, before the deformity becomes so great as to be incurable. This is an exceedingly important subject, because you will have an opportunity to use the knowledge you may acquire very frequently. It occurs oftenest in cities, and I think San Francisco affords as many cases in proportion to the population as any city in the world, because we have very little warm weather. The poorer classes, in consequence of the scarcity of houses, have heretofore been too much crowded, and they have too much baker's bread, butter, and Irish potatoes to obtain a solid and perfect development.

Sprains and bruises are very important to the general practitioner, and should follow the consideration of spinal affections, because the bones, ligaments, and joints, are almost exclusively implicated. As before stated, the osseous and ligamentous tissues, when in a healthy condition, are almost entirely devoid of sensibility, but when strained, that is when stretched or contused, they sometimes become exceedingly painful. The hinge-joints suffer most from strains, such as the knee, ankle, and joints of the fingers and toes. Sometimes a strain is followed by consequences more serious than a compound dislocation of the ankle-joint. Two prominent citizens were riding in the same buggy on Stockton Street, when the buggy capsized and they were both thrown out; one had a compound dislocation of the fibula, and the other a strained ankle; the former was well in six weeks, the latter was quite lame for more than a year.

I have mentioned these cases for the purpose of showing that such injuries, without either a fracture or dislocation, may prove serious, and should not be neglected. Some years since, in stepping from my buggy carelessly, my foot came in contact with a brick which turned and strained the ligament connecting the tarsal and metatarsal bones of the little toe, as well as the ankle-joint on the outer side. The pain was acute, the foot swelled rapidly, and I was lame for several days from that apparently slight injury, which, neglected, might have been followed by serious consequences. After a strain

inflammation may supervene and involve both the synovial membrane and the periosteum. The pain in such cases is sometimes exceedingly violent. Leeches should be applied, or a number of punctures made to cause a sufficient loss of blood to relieve the distended vessels of the part. If the injury is not serious, cold water may be applied during the day, or an evaporating lotion composed of alcohol ʒij, and aqua font. ℥xij, or a solution of acetate of lead; but at night I prefer the following mixture: plumb. acet., ʒiv; tinct. opii, ʒij; tinct. arnicæ, ʒiv; aquæ font., a quart. Four or five double of flannel or soft old linen should be saturated with this mixture and applied, covered carefully with oiled silk and secured by a roller bandage. If this application does not afford immediate comfort, direct that a fourth of a grain of the sulphate of morphia be administered every hour to an adult male until relief is obtained. The patient is so much better by morning that he generally insists on discarding the evaporating lotion and cold water, and desires to continue the use of the mixture already given. Should an injury only produce a contusion of the skin, subcutaneous tissue, and muscle, and be accompanied with violent pain, the following mixture will afford almost instantaneous relief: ol. terebinth., ʒiv; tinct. aconiti rad., chloroform, āā ʒvj; gum camph., ʒiij. M. Apply ʒvj to the part, rub gently for some minutes, or until the mixture either evaporates or is absorbed. When the contusion is sufficiently violent to cause suppuration, an opening should be made so soon as fluctuation is distinct. Should the contusion be so violent as to produce destruction of the articulating surfaces, the only alternatives left are a resection of the joint or anchylosis, which sometimes results from keeping bones in contact which have by inflammation been deprived of their articulating surfaces. I will present a photograph of the foot of a gentleman from Stockton, who came to this city to have his leg amputated. I persuaded him to allow me to remove the diseased bones. I removed at the first operation the metatarsal bones, and when he recovered from that, all the bones of the ankle-joint, including the os calcis. In a few days his diarrhœa ceased, the appetite returned, and in three or four months he returned to Stockton, with anchylosis of the joint, but with a sound and useful foot and leg.

A gentleman, a few years since, came from Humboldt County, in this State, with caries of all the bones of the ankle-joint. They

were all removed with an exceedingly fortunate result, and if the injury had received proper attention at first, the difficulty never would have become so serious. The joints are occasionally wounded, and when they are, you should always regard the lesion as one of an exceedingly serious character; if you do not recollect how you have been directed to treat such a difficulty, you should ask for a consultation. The synovial fluid should be removed, the wound should be closed by silver sutures, and a long splint placed upon the back of the leg and kept constantly applied until union by the first intention has occurred. When you are satisfied that the wound has healed, remove the sutures and allow the patient to use the joint, so as to prevent anchylosis. I treated a man, aged about forty years, who had been drunk for about a week, and while in that condition had fallen against a box from which a nail projected, and was forced into the knee-joint. He continued to drink for several days, and when I was called by his employers, his knee-joint was immensely swollen, very painful, and so much diseased that his friends had very little hope of his recovery. I placed his leg upon a double inclined plane. Hot-water dressings were applied constantly, and a sufficient amount of sulphate of morphia was administered to relieve pain. When the limb was placed upon the splint, about a pint of unhealthy synovial fluid escaped daily from the knee-joint, yet in three weeks the wound was healed, and he left San Francisco without even thanking me for the most remarkable and unexpected cure that ever occurred either in this or any other city.

I attribute the result to the position of the limb and the constant use of morphia. The pain was relieved at once, and he was not allowed to suffer at all during the time he was confined to bed. After the second week the joint was moved once a day, until perfect motion was restored. I was then a stranger in San Francisco, and invited several physicians to examine the patient; there is but one now living of those who saw him. Should extensive laceration exist, and the tendons and bones be torn and mangled to such an extent that the limb can never be useful, it should be removed, for if it be allowed to remain, tetanus might occur, and in any event, the patient after long suffering would not have a limb worth the trouble and risk it cost to save it. In this connection I will refer to inflammation of the joints, which may result from injuries, strains, contusions, or exposure to cold. In rheumatic affections produced

by cold, of course you will employ the remedies which have been found most useful in such cases. And as we may not have occasion to refer to this subject again, I will give you the best combination of medicines that has ever been suggested: Potass. iodidi, ʒiv; vin. colch. sem., ℥iss.; tinct. aconiti rad., ℥iss.; ext. acteæ racemosæ fol. (cohosh), ℥iij; syr. zingiberis, ℥iss. Misce. Sig. Take one teaspoonful four times in twenty-four hours, with a quarter or half a grain at night of sulphate of morphia, to relieve pain and produce sleep. Professor Flint, Sr., differs from me, but I still hope that he will condescend to try the favorite remedy of a California physician, and then publish in his next edition the result of his experience. In scrofulous inflammation of the joints, the disease is called white swelling, because there is no discoloration of the skin. When inflammation of the synovial membrane exists, it is rendered evident by the fluctuating enlargement of the joint, the increase of the synovial secretion producing fluctuation. When the disease is not controlled by the use of the specifics in such cases, such as the iodide of potassium, iodide of iron, quinine, or any of the remedies usually prescribed, even the much overrated cod-liver oil, then I always endeavor to produce anchylosis by placing the limb in the most favorable position, should that occur. This treatment is applicable only to the knee and elbow-joints. When I had charge of the United States Marine Hospital, in 1854, a sailor was admitted with complete anchylosis of all the joints of the lower extremities. He was young, and willing to submit to any treatment in order to obtain relief. I had chloroform administered, and all the force which I thought was proper to apply was used, but the joints resisted. Soon afterwards he left the hospital, disappeared, and I have not seen him since. In the treatment of such cases, unless you desire to produce anchylosis, the joint should be flexed and extended every two or three days. In Europe, in consequence of the unwillingness of such patients to take exercise enough to prevent anchylosis, they have in every hospital a room with a metallic perforated floor, which is heated to such a point that a patient is unable to stand upon it a minute, but by constant motion the heat is not sufficiently great to burn. This course of treatment is universally adopted in old cases of chronic rheumatism, and many which were regarded as incurable have been rendered useful members of society. When I had charge of the United States Hospital, in this city, a man was

found there whose feet were so sensitive that they had not borne his weight for two years. The soles were greatly thickened, and he would not, unless forced, place his feet upon the floor. I had him taken out of bed by two strong men, and compelled him to walk an hour, morning and evening; in a few days he acquired sufficient confidence to leave the bed himself. In three or four months he left the hospital perfectly well, and was no doubt as good and active a sailor as was ever shipped from this coast. In such cases patients should not be indulged; so soon as the acute inflammation subsides, exercise of the joints should be recommended and insisted upon, until the soreness and stiffness entirely disappear. In chronic affections of the knee-joint I administer tonics—apply counterirritants, such as croton oil, blisters, tincture of iodine, or the ol. terebinth. liniment, which I usually prescribe when the pain is violent, and I think it relieves pain more speedily than any application which I have ever made. When acute inflammation subsides, and some induration remains, tincture of iodine and arnica, equal parts, should be applied twice every day with a camel's-hair pencil until the induration disappears. When the enlargement of the joint resists internal treatment, the application of the tincture of iodine and arnica, I would advise what is called an elastic knee-cap; when applied it produces permanent pressure, which increases the action of the absorbents more than any other remedy or combination of remedies that ever was administered. Should the bandage fail to increase the action of the absorbents, then the knee should be padded with cotton so as to increase the pressure of the bandage.

LECTURE XXX.

GENTLEMEN: In my last lecture I spoke of lacerated wounds of the joints. To-day I will describe other difficulties with which you may have to contend.

Incised wounds of the knee-joint, although not frequent, occasionally occur; in every instance I have seen, the wound was produced by a tool called the foot-adze, a dangerous instrument even in the hands of a skilful carpenter. In such cases, remove from the wound all the synovial fluid, insert as many points of interrupted silver suture as will close it, in other words to bring and hold the edges together until they unite, so as to prevent the escape of the synovia. In dressing such wounds, always make provision for the escape of the bloody serum which necessarily results from a solution of continuity. Apply either the warm-water dressing or simple cerate. Never apply to such a wound dry lint, adhesive plaster, or collodion. If an incised wound of the knee or any other joint be treated as indicated, and the part be kept quiet, it almost always heals. Should the ankle-joint be wounded, the water dressing should be applied, a compress of cotton placed over the wound, and a splint on one side of the joint, which can be secured by the same bandage that retains the compress in its proper position. In wounds of the knee-joint, after pursuing the course before given, a long splint should be placed upon the back of the thigh and leg, and retained until the wound heals and the sutures have been removed. I rarely remove the sutures, which should always be of silver wire, before the eighth day, and sometimes they are allowed to remain longer if no evidence of ulceration exists.

When I entered the profession, it was supposed that if a joint was opened, it was impossible either to save the limb or to restore its usefulness. It is now known to every good surgeon that a joint may be opened by either a punctured, lacerated, or incised wound, and the patient may recover the perfect use of the joint, and the limb become as useful as before the occurrence of the injury, pro-

vided he receives proper medical and surgical treatment. But when inflammation does follow lacerated wounds of the joints, if active remedies are not employed, serious pathological changes speedily follow. You should resort to irrigation until the inflammation has subsided, and then warm-water dressings should be applied to promote granulations, which must be developed before cicatrization can take place. I repeat, in all such cases, give sulphate of morphia in sufficient doses to relieve pain. If the knee-joint be injured, it should be regarded as exceedingly serious, in consequence of the size and importance of the articulation. When the inflammation of the synovial membrane is not violent, it may result in the effusion of serum, or dropsy of the joint, and may be aggravated by exposure, violent exercise, or excess either in eating or drinking. In such cases exercise should be prohibited, and blisters should be applied alternately to each side of the knee once a week. Should the patient be scrofulous, the iodide of potash and the fluid extract of stillingia should be administered until the general health is improved.

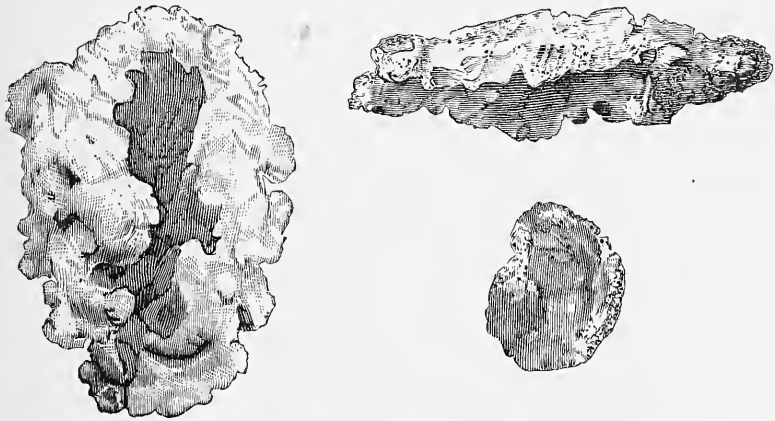
Enlargement of the knee-joint frequently results from rheumatic inflammation, of which I have already spoken. You should always, when the synovial membrane is inflamed, move the joint occasionally, otherwise it will become anchylosed, and its usefulness be destroyed. Sometimes the synovial membrane becomes either thickened and ulcerated or entirely destroyed, and then, when the denuded ends of the bones come or are placed in contact, anchylosis may take place and give the patient a useful limb, provided the anchylosis occurred when the limb is in the best position. Occasionally, however, it is impossible to obtain this result, and then the only alternative is amputation. Should disorganization extend beyond the articulating surfaces, resection of the articulation should be performed, and the case treated as described in the cases presented to the State Medical Society of California.

The next subject to which I will direct your attention is the existence of movable cartilages in the knee-joint. This singular disease fortunately occurs very rarely; it cannot be cured without an operation. When I had charge of the United States Hospital, in 1854, there was a case in that institution which had been allowed to remain two years and a half, in consequence of the surgeon in charge not being disposed, or not feeling that he was competent, to remove a foreign body from the joint. Sometimes the patient could walk

as well as any one in the hospital, but when the cartilage slipped between the articulating surfaces he would become helpless and fall, provided he could not take hold of somebody or something, until by moving the joint the cartilage was displaced and the difficulty removed. Being unwilling that a curable case should remain longer as a burden upon the government, I determined to remove the difficulty. I had the cartilage forced up as far as possible upon the inner side of the patella, and fixed in that position by the thumbs of a strong assistant. A valvular incision was made, and the foreign body removed. The wound was then closed by the interrupted silk suture, simple cerate with a compress was applied and secured by a bandage. The extremity was then placed upon a splint, and retained in that position until the wound was entirely healed.

You must be exceedingly careful, in such cases, not to produce ulceration of the skin by applying a tight bandage over the compress, for should that occur the operation would not only fail, but the exposure of the articulating surfaces might produce sufficient

Fig. 70.



inflammation not only to destroy the joint but also the limb. These operations require great care. I have operated five times with success, twice since these lectures were delivered. Two of the cartilages removed are represented by the wood-cut; the other three operations were performed at the County Hospital, before the class, and were as successful. To-day, August 23d, 1876, I discharged an old man from the hospital, who had a floating cartilage removed three

weeks since. It was very small, and he has not suffered any inconvenience from the operation.

After the cartilage is removed, as some of the synovial fluid follows its removal, before closing the wound remove by pressure and a wet sponge everything that may intervene that could prevent union by the first intention. A gentleman from Napa applied to me for advice who had more than a dozen cartilages in the knee-joint, which were exceedingly troublesome. I told him that I would not persuade him to have an operation performed, but if he should request me to operate, and if he would take the responsibility, I would not hesitate, because I believed that it would be successful. In this case I think the trouble was due to an injury from a fall upon the knees. The sailor fell through a hatchway. The other two fell some distance down a shaft in the mountains of California, and supposed they had entirely recovered, when this lesion showed itself.

When any important joint of the body becomes painful, and is swollen without any discoloration of the skin, the affection is called a white swelling, and may be located in the synovial membrane of the joint, the periosteum, or the cancellated structure of the bone. In the latter case it is generally produced by the deposition of tuberculous matter. These cases are all of a scrofulous character, and require tonics, stimulants, and generous diet. If an abscess forms, an incision should be made. If the disorder affects the lower extremity, it should be somewhat flexed to render it useful. A splint should be applied, and the knee-joint kept still until anchylosis results. If the periosteum is affected, the carious bone should be removed with the trephine, gouge, or chisel, according to the quantity of the diseased bone, the part involved, as well as the locality of the disease.

In strumous children a disease called gelatinous degeneration of the synovial membrane takes place, as well as of the cartilages of the joint. They present a grayish-yellow gelatinous mass, which varies from a line to half an inch in thickness. Sometimes they are absorbed, but more frequently suppuration takes place. As soon as fluctuation is decidedly perceived, an incision should be made to allow the secretion to escape, then you have a condition precisely similar to the one already described. The only alternative left is to produce anchylosis. Place the extremities of the bones in contact, and keep them in that position for eight or ten weeks, when, if it

is found to be impossible to produce anchylosis, and the local disease continues, you may propose either amputation or resection; the latter is preferable.

In all scrofulous affections, when all the diseased bone can be removed, constitutional treatment is of the greatest importance. To children I often give half a grain of calomel at night for a week, for the purpose of acting upon the stomach and liver, and when they become healthy a tonic and alterative treatment should be prescribed, such as sulphate of quinine, with a laxative; or the tonic mixture, composed of senna, nux vomica, aconite, and hydrocyanic acid, which I regard as the best combination of remedies which I have ever prescribed. The recipe for its preparation I have already given. When iron is indicated, give the precipitated carbonate, the iron by hydrogen, or the iodide of iron. You should not rely too much upon iron alone, but give with it laxatives, such as rhubarb or senna; the latter acts upon the liver, and should be preferred.

There is another disease of the joints which I propose to treat separately, in consequence of its frequency and importance. Morbus coxarius, or, as it is usually called, hip disease, prevails in cold damp climates, and hence occurs frequently in San Francisco. It affects children between the ages of one and four years, yet it is not confined to any age, as I treated a man about fifty, who subsequently died in St. Mary's Hospital, after the operation of resection was performed by one of the visiting physicians of that institution. I have, in this city, met with children who had dislocation of the hip-joint from this disease before they were three years old. Formerly it was believed that the disease commenced in the acetabulum, that the cavity became filled by the diseased synovial membrane, the round ligament was destroyed by ulceration, and the head of the thigh-bone was dislodged or dislocated, and then the limb is permanently shortened, and the patient is exceedingly fortunate if an abscess does not form in consequence of the existence of diseased bone which no healthy tissue will accommodate. This disease generally commences in the bone, and ultimately the synovial membrane becomes implicated. The cartilage by which the bone is covered inflames, ulcerates, and sometimes is entirely destroyed, so that it cannot remain in its natural position, and the bone becomes dislocated.

Symptoms.—The patient almost always complains of pain in the

knee or the posterior part of the leg, slight lameness exists, and pressure made over the head of the thigh-bone by the thumb and fingers generally causes considerable pain. The hip shrinks in consequence of the inactivity of the gluteal muscles, produced by the indisposition and inability of the patient to take active exercise. The appetite is often impaired, and if, with the symptoms enumerated above, a scrofulous diathesis exists, you should treat the patient for hip disease. In other words, prescribe such food as will make bone and brain. Give quinine, combined with the fluid extract of senna, have Sayre's modification of Davis's splint applied, give the patient a pair of crutches, encourage him to take as much exercise as he desires, and you will succeed in arresting the disease and preventing the dreadful consequences that ordinarily result from this affection. Sometimes a child is brought to my office, and complains of pain in the hip-joint; slight lameness exists, which often results from rheumatism or from a fall. When they complain of the hip, I generally prescribe my anti-rheumatic mixture, with the turpentine mixture, which I think is the best anodyne liniment that can be applied. ℞.—Ol. terebinth., ℥ivss.; tinct. aconit. rad., chloroform, āā ℥vj; gum camph., ℥iij. M. Sig. Apply ℥vj, and rub in well. When the pain is produced by injury or cold, the difficulty generally speedily disappears, but I am sorry that I cannot promise the same result in morbus coxarius when the same treatment is adopted.

About twenty years since I was called to see the son of Mr. Walton, who was the proprietor of the Fremont House in this city. His son was lame, and his physician had treated him for rheumatism for several months, without the slightest benefit. After the consultation, they refused to submit to the treatment which I prescribed. The boy finally had a dislocation of the hip-joint, and is now a resident of Sacramento. Dr. Cooper was employed after I withdrew, and he applied a splint made of tin. It was very heavy, and one day after the boy had worn it for some time he fell downstairs, and the hip-joint was dislocated, and young Walton was rendered a permanent cripple. When a patient has hip disease, he often lingers one, two, or even three years, and then by accidentally falling sustains a dislocation of the hip-joint, which produces permanent deformity.

The head of the bone in such cases is dislocated upward and back-

ward; the toes are turned inward, and the limb permanently shortened. But this is not the most serious difficulty that may result in such cases. Very frequently you will find after the dislocation, and sometimes before, that an abscess will form, and presents directly over the hip-joint. This may result from disease either of the acetabulum or of the head of the thigh-bone. In children there may be, even after the formation of an abscess, some prospect of recovery. The diseased bone sometimes becomes detached, and escapes through the external opening, and the abscess may heal; but in advanced life I think it always terminates fatally. It is always best to treat a case of this kind in such a manner as to prevent any such difficulty.

Whenever the diagnosis is made out by the existence of pain in the knee and posterior part of the leg, the extremity being slightly elongated, and the hip flattened, particularly when the hip-joint is painful on pressure, you should treat the case as before indicated. Tonics, alteratives with nutritious diet, counterirritation, with the mechanical means recommended, with an instrument adapted to keep the articulating surfaces from coming in contact, so that exercise will not increase the local difficulty. The patient should take exercise every day with crutches, which improves digestion and prevents the waste which would otherwise occur. In the application of this apparatus, great care should be taken not to make too much extension and counterextension. I had a case a few years ago in this city in which I felt great interest, in consequence of the parents having lost a son from the same disease, by being confined to bed until he died from exhaustion. In the second case I had Sayre's modification of Davis's splint applied; he was allowed to take as much exercise as he desired, and was so well when the specialist arrived in San Francisco, that he said to the parents that it was one of the best-managed cases that he had seen, and that he would insure a cure for five dollars. He applied the same instrument that I had used for more than a year so tight, that I said to Mr. Folkers that I did not approve of so much force being used, and I thought very unpleasant consequences would result. He also recommended that a weight of ten or fifteen pounds should be attached to the foot when the boy was in bed. The next day the boy was attacked with inflammation of the hip-joint, an abscess formed, and I opened it. Since then there has been a constant discharge from the part, and it is scarcely possible that he

should survive. Now I am censured by the friends for having consented to the consultation from which resulted the present miserable condition of a strong healthy boy. I did not ask for a consultation, and under the circumstances I could not refuse one, but I must say that I did not admire the man with whom I consulted, and I predicted the result.

Resections of the hip-joint present no difficulty in the execution. I have performed the operation myself three times, but have not

Fig. 71.

been satisfied with the result, and I do not think that I could under ordinary circumstances be induced to repeat it. In children the limb may be saved; but it is attached to the pelvis by the muscles,

and is nothing better than a dangling mass of bones and flesh, which is an incumbrance of the most serious character. Recently I have resected the femur; the details and results I will give elsewhere.

Fig. 72.

Amputation of the hip is much better than resection. When the head of the thigh-bone is exposed, there frequently, and indeed almost universally, exists caries of the acetabulum, which it becomes necessary to remove. This of course destroys the articulating sur-

faces, and consequently the use of the lower extremity. The resection of the elbow and ankle-joint I have considered and demonstrated, and it is not necessary to detain you with a reconsideration of these operations. I have resected the bones of the wrist, but this is not generally considered as a very desirable operation; you cannot calculate on much subsequent motion of the joint, and when the tendons are implicated very little motion of the fingers should be expected.

LECTURE XXXI.

In my last lecture, on diseases of the joints, I neglected to notice an affection peculiar to young females. It is regarded as a nervous or hysterical affection of the joints. It resembles rheumatism more than any disease, except that it is unaccompanied by fever, and the pain is not increased by exercise. It occurs usually between the ages of sixteen and twenty, and attacks those who otherwise do not enjoy good health, and are generally unwilling to take active exercise. The feet and legs usually swell. In such cases give the precipitated carbonate of iron, or iodide of iron, with laxatives, as previously recommended, and very soon the swelling and pain will disappear.

Muscles are liable to injuries, but not to disease. When a muscle is wounded in the direction of its fibres, no difficulty will be experienced in effecting a union. Approximate the fibres, keep the part at rest, provide for drainage, and union will take place as rapidly as it would if other tissues were injured. When the wound is very deep, unless the sutures are passed to the bottom, it sometimes becomes necessary to apply a compress on each side, and secure them by a roller, or, if preferred, by a many-tailed bandage. Sometimes the fibres of the muscles are lacerated by excessive action, and when they are not really lacerated they, from overaction or distension, lose their contractile power; it is thus the abdomen becomes pendulous. There is one muscle which is sometimes dislocated, viz., the latissimus dorsi, when it passes over the inferior angle of the scapula. It is intended to keep that bone in its proper position, or rather to aid the subscapularis in performing that office. In such cases the scapula becomes very prominent, and there is some loss of use of the arm. There was one case of this kind in the County Hospital last summer, to which I directed the attention of the class. Physicians should know that such difficulties do occur, although nothing can be done that will either remove or alleviate the deformity.

Malignant tumors, developed in the adjacent tissues, may implicate the muscles, but they rarely appear primarily in the muscular tissue.

The muscles sometimes become paralyzed and atrophied by want of nervous influence. Scriveners' palsy is produced by laying the arm upon the writing table. Dairymen often have paralysis of the hands from milking, and seamstresses from sewing too constantly. I myself had paralysis of the right arm from driving a horse that pulled very hard upon the bit, and nearly two years were required before I recovered the use of the hand, and if I had not been subjected to that misfortune I should now most probably have been a pauper in my native State, as almost all are who occupied the position which I did when I emigrated.

Partial paralysis of the face may occur at any age, and is always preceded by pain in the vicinity of the ear. Sometimes a discharge exists, and when the paralysis results from sanguineous effusion nothing will afford permanent relief. This difficulty frequently results from secondary syphilis. I have recently treated three boys who were thus affected. The paralysis occurred after great suffering, and might have been prevented by proper attention. Paralysis always results from pressure, which may be produced by a thickening of the tissues covering the part, or from the effusion of either blood or serum. When it is due to the extravasation of blood it is incurable, but serum may be absorbed, and when the cause is removed the effect will of course disappear.

Tendons are as liable as any other tissues of the body to be injured. Sometimes they are ruptured by the action of the muscle for which they form an attachment. The action of the gastrocnemii muscles frequently ruptures the tendo Achillis. When I was a mill-boy I witnessed an occurrence of this character. A man, whilst carrying a bag of corn up an inclined plane, fell just at the door of the mill, and when a physician arrived it was ascertained that the tendo Achillis was ruptured. I was very young at the time, and do not know what was the result of the injury. Five or six years since a San Franciscan, who had been on a visit to the East, had that tendon accidentally divided by a piece of crockery ware. The physician of the ship used adhesive plaster to close the wound, which was passed transversely, by which the skin was pressed down between the ends of the tendon, and prevented union. When he returned I dissected the skin from the space between the ends of the tendon, the extremities of which were removed and placed in contact, and retained by extending the foot. The external wound was closed by silver sutures,

and at the expiration of three weeks the tendon was united, and he lived in this city for several years, and finally died in the St. Mary's Hospital, of paralysis produced by specific disease.

Sometimes the tendons of the fingers are ruptured by pulling on a tight boot. In such cases the finger should be flexed, and kept in that position until union takes place. A few years since a man named Mulligan, who was generally known in this State, broke the tendon of the forefinger of the right hand, which I treated. The tendon united in two weeks, and the finger was as strong as before the accident. Tendons unite very rapidly, and generally in ten days after the operation of tenotomy they are united, provided the extremities are not separated more than two inches and a half. Tendons are said to inflame very readily, and also to lose their vitality more rapidly than any other portion of the body. The adjacent parts become inflamed, the congested vessels cease to convey blood, and the tendon being deprived of its nutrition loses its vitality. Tumors often appear upon the tendons, and are produced by the sheath being either lacerated or distended, which allows the lubricating fluid to escape into a sac; this is called a ganglion. Formerly such swellings were removed. I performed the operation once, but was not satisfied with the result. I then endeavored to lacerate the envelope, and force the contents into the subcutaneous cellular tissue, and by pressure obliterate the cavity. Not being satisfied with this proceeding, I now open the sac subcutaneously with a tenotomy knife, press the contents into the subcutaneous cellular tissue, and then apply a compress, and secure it by adhesive plaster. It is not safe to rely upon a bandage in such cases, and indeed in any case in which it is necessary to continue the pressure for two or three weeks, in order to effect a permanent cure.

There is another very common disease which is not very well understood. It is located in the bursæ mucosæ of the joints, and affects the sheaths of tendons, particularly of the large extensor muscles of the thigh. It may be either rheumatic or syphilitic, and I must say that it has annoyed me more than any other disease that I have ever been compelled to treat, except peritoneal hernia. I practiced surgery more than twenty years before I became fully satisfied that the tumors which appear in the linea alba are produced by an escape of the peritoneum through a very small opening, and still longer to ascertain the true character of the enlargement that some-

times appears above the knee-joint, and frequently becomes very large and troublesome. In 1854, when I had charge of the United States Marine Hospital, I was treating a patient on Nelson Street, who was suffering from syphilitic rheumatism with a distension of the sheaths of the extensor tendons. I removed the fluid with a trocar and canula, and injected into the cavity equal parts of the compound tincture of iodine and water. It was allowed to remain five minutes, and then permitted to escape. In two weeks the knee was entirely well, and I operated upon the other. After the removal of the solution of iodine, the lower portion of the thigh became very much inflamed, suppuration took place, and so soon as it occurred I made an incision, and gave him a bottle of porter every day. He recovered entirely by this constitutional and local treatment.

The bursæ very often become greatly enlarged, particularly the bursæ of the patella and olecranon process of the ulna. The former generally results from throwing the weight of the body upon the knees when scrubbing the floor, and the latter by striking the olecranon process against some solid body. Generally the enlargements can be removed by painting them well, morning and evening, with equal parts of tinct. iodine and arnica. Should this treatment fail, you may either draw the fluid off with a trocar and canula, and inject the sac with the compound tinct. of iodine and water, or make an incision, insert a tent, and keep the wound open until it heals from the bottom, or in other words until the cavity is obliterated. I will refer to this subject again, when specific diseases are under consideration. They are the most prolific source of this difficulty, particularly near the knee-joint.

Wounds of the Throat.—I will now say a few words about wounds of the throat, which, like all other solutions of continuity, are either punctured, incised, or contused. They are generally incised and transverse, and are almost always near the os hyoides, sometimes above that bone, but more frequently below. Always ascertain, if possible, the location of the wound. When deep, if upon the upper part of the neck, it may extend into the pharynx; if lower down upon the neck the larynx is generally involved, but it is very seldom that the large vessels of the neck are wounded. These wounds are generally made by a razor, for the purpose of committing suicide, the subjects being tired of life. They seldom succeed, not more than one in twenty cases, because they draw the instrument trans-

versely across the throat. Suicides generally become alarmed by the appearance of the blood, and desist before their object is accomplished.

It is important in such cases to ascertain at once whether the incision is above or below the rima glottidis. If above, the blood may pass into the larynx and produce suffocation. In cases of this character, you must ascertain whether the larynx, trachea, or pharynx be wounded; if the latter, it is important to turn the patient upon the face, take hold of the edges of the wound with the finger and thumb, and press them together, the patient being upon the face, and being kept in that position with the wound firmly closed until the hæmorrhage has entirely ceased. This position is of importance, in order that the blood may flow externally and not into the larynx. Should the artery be divided, death would occur before any assistance could be obtained. Hæmorrhage from the internal jugular vein can be arrested by the pressure made by means of a small portion of sponge, which should be allowed to remain six or seven days, and when removed not the slighest hæmorrhage will follow. I was performing an operation upon the neck, and wished to expose the common carotid; the external incision I thought was too small, and enlarged it with a pair of scissors, I now think carelessly, and either the internal jugular or the superior thyroid was wounded. A small piece of sponge was applied, and retained in contact with the wounded vein until the ligature was applied to the carotid, when a suture was passed through the edges of the wound directly over the sponge. It was allowed to remain seven days, and when removed the wound in the vein was closed, and the patient recovered as rapidly as if no accident had occurred. In applying a ligature upon the carotid, great care should be taken not to wound the internal jugular vein. It is on the outer side of the artery, and low down on the neck it is very large, and lies over the artery so as to conceal it entirely, hence great care is required not to wound it whilst ligating the common carotid.

When the pharynx is wounded, the injury is much more serious than if you have simply a wound of the larynx. In a case of that character, the patient should be fed through a tube passed into the œsophagus, and the nutriment thrown by a syringe into the stomach in sufficient quantities to supply the waste of the body. In that way you can sustain the patient until the wound closes. I shall

always recollect an old man who lived near my father's place, whose name was Pease. He had a disappointment when young, attempted suicide, and cut into the œsophagus. Whenever he attempted to swallow a fluid, a portion escaped through an opening upon the upper and central part of the neck. He was at least seventy-five or eighty years old, lived entirely alone, and cultivated land enough to supply his wants. But in consequence of this early misfortune, he never associated even with his nearest neighbors, and never appeared to recognize any of the children when they passed by his place when out hunting. Wounds of the neck should always be closed by the interrupted silver suture, the points being sufficiently numerous to bring the edges in perfect apposition; then the warm-water dressing should be applied, and union by the first intention rarely fails to occur.

It sometimes becomes necessary to make an opening into the larynx or trachea, or in other words to perform the operation of laryngotomy or tracheotomy, in order to prevent suffocation, when the respiration is rendered difficult either by inflammation, serous effusion, or the pressure of an aneurismal tumor upon the trachea above the upper extremity of the sternum. I performed this operation once, but I never will perform it again without ascertaining the cause and extent of the difficulty. In diphtheria, I now in every case positively refuse to open the trachea, and in my own practice I never find a case in which an operation is necessary, except when a foreign body finds its way into the respiratory apparatus.

Sometimes in tonsillitis or quinsy, the passage to the lungs is so contracted that the breathing becomes very difficult, and then instead of opening either the larynx or trachea, expose the tonsils. Make a free incision on each side, and the difficulty will entirely disappear. When the respiration becomes difficult, as in croup, the blood does not become oxygenated in the lungs, and consequently does not afford the heart a sufficient quantity of healthy blood to enable it to continue the performance of its function. In nearly every case of croup in which operations are usually performed, you can give relief by the subcarbonate of potash. Give to a child, two or three years old, two grains of the salt every two hours; the albumen which forms the membrane is dissolved, and in many cases the croupy symptoms disappear in a few hours. If this prescription, which I obtained from a German medical journal, does not remove the deposit, it will be

necessary to operate. But when foreign bodies find their way into the trachea, you must make an opening, which can be accomplished either by dividing the crico-thyroid ligament, or two or three of the upper rings of the trachea; or the latter may be opened below the thyroid gland and just above the superior extremity of the sternum. I witnessed an operation of this character, performed by my former partner, Dr. William H. Wells, in Columbia, South Carolina, which was successful. Before cutting into the larynx or trachea, divide the skin, the subcutaneous cellular tissue, and the artery, a branch of the superior thyroid that crosses the crico-thyroid. That vessel should be ligated, and when the hæmorrhage has been entirely arrested, the crico-thyroid ligament should be divided transversely, and should any foreign body be in the trachea it will, with the first expiration, be expelled, and if not, long delicate forceps may be introduced for the purpose of removing it.

Sometimes it is considered advisable to divide the upper rings of the trachea. In such cases, the same precautions should be taken. Any artery which is divided should be ligated, and the trachea opened freely. Three or four of the rings may be divided without the possibility of any serious difficulty occurring. Both of the operations recommended are perfectly safe, if carefully performed. I always have the skin raised by myself and an assistant, then a perpendicular incision should be made, extending through the skin and subcutaneous cellular tissue, down the larynx or trachea. Should the artery be divided, it must be ligated before the opening is made, either through the crico-thyroid ligament or the rings of the trachea. The former should be divided transversely, and the latter perpendicularly.

When the superficial vessel has been ligated, not the slightest danger of hæmorrhage exists, as there are no bloodvessels in that vicinity from which a fatal hæmorrhage could occur. So soon as the opening is made, and the air rushes into the lungs, the patient is relieved, provided there existed an obstruction, and if the operation was performed to remove a foreign body from the trachea, it is almost always forced out by the first expiration. I shall never forget a case in which a persimmon seed found its way into the trachea of a child two or three years old. The parents lived in Newbury Village, South Carolina, and I lived in Columbia, and was sent for to perform the operation. In order to obtain a good light, the door of the parlor was selected, and when the crico-thyroid ligament was divided,

the seed, covered with mucus and blood, escaped from the wound and lodged upon the facing of the door, which was more than a yard from the patient.

Should the foreign substance still remain, I would advise you to use the long delicate forceps exhibited. Should suffocation be threatened, in consequence of a contraction of the larynx, then tracheotomy should be performed, and an opening made large enough to admit the tube, by which the patient is enabled to breathe until the obstruction disappears. I am opposed to the instruments invented for this operation. A lancet or bistoury is all that is required to divide the crico-thyroid ligament, and a scalpel should be used to complete the tracheotomy; then the usual instrument should be inserted and continued so long as necessary. Occasionally when a syphilitic ulcer of the larynx heals, the size of the larynx is very materially diminished, so much so that suffocation must take place without an operation. About fifteen years ago, a gentleman came to my office about sunrise, and begged me to see a man on the corner, or near the corner, of Davis and Sacramento Streets. His breathing was so difficult that I could hear him at least a hundred yards. I opened the larynx with my lancet, which afforded immediate relief. The ordinary tube was introduced, which he did not like. He then arranged two goosequills, attached them to a large tube which he passed around his neck, and covered it with a comforter. The air was thus compelled to pass through a warm tube five or six feet in length before it reached the lungs, and consequently produced much less irritation than resulted from the ordinary treatment. He wore that apparatus several years, and returned to his native country comfortable, but not well, although the tertiary symptoms had entirely disappeared. Dr. Stout, of this city, has invented an instrument for the purpose of opening the trachea. I think it is as good as any instrument that has been recommended in such cases. I have never availed myself of the advantages presented by these productions of genius, because I could always perform such an operation with a lancet or a pocket-knife, and could remove the tonsils with an ordinary fish-hook and a jack-knife with the point broken off, so as to prevent the possibility of any serious result.

In conclusion, allow me to advise you never to perform tracheotomy or laryngotomy, unless the responsible party is able to pay the bill. The man on whom I operated, on Sacramento Street, sold

his property, did not pay me one cent; yet I hope he is as comfortable as any man who has a hole in his trachea can be, when he knows that the man who saved his life did not receive one cent either for the operation or the subsequent attention. Never open either the larynx or trachea in diphtheria. I have operated to gratify the parents, and when the child dies they say that the doctor committed homicide. I have lived a long time, have treated many children, and I beg of all young practitioners never to perform tracheotomy in cases of diphtheria. They always die, because the false membrane has formed in the lungs, and has destroyed the function of these important organs.

LECTURE XXXII.

Wounds of the Chest.—The last lecture was concluded after considering the cases by which laryngotomy and tracheotomy are rendered both necessary and proper. I think I then told you never to perform an operation upon the air-passages without a careful examination, because I once performed such an operation by the request of two prominent physicians of this city, and at night, without affording the relief which they expected, because the difficulty of respiration was produced by an aneurism of the aorta. Sometimes great difficulty of deglutition may result from aneurism, but more frequently it is produced by stricture, caused by swallowing either nitric or sulphuric acid by mistake. Some years since, a child, whose parents lived on Ohio Street, near a soda factory, visited the place and took a drink from a bottle that contained sulphuric acid, instead of soda water, and died of starvation in eight or ten days, being, so long as she lived, unable to take anything into the stomach. I have met with other cases in which stricture was produced by the same cause. It is very seldom that with a bougie you can remove a cicatrix produced in that manner. In ordinary cases of stricture of the œsophagus, a large gum-elastic bougie may remove the temporary inconvenience of a stricture. It should be passed every alternate day, and allowed to remain fifteen or twenty minutes, but, gentlemen, I must say that the treatment of such cases is never satisfactory.

The next difficulty of a prominent character that presents itself is bronchocele, or, as it is usually called, goitre. It presents three varieties: 1. The vascular; 2. The encysted; 3. The calcareous. The first is called vascular sarcoma, and is simply an enlargement of the thyroid body, which sometimes increases to an enormous size. It prevails in cold damp climates, as in the mountains of Switzerland, Pennsylvania, and particularly in the valleys of the Blue Ridge and Cumberland Mountains of North Carolina, as well as the northern portion of this State and Oregon. The sun is excluded

from these coves, as they are called, until ten or eleven o'clock, and never shines upon them for more than three or four hours, even during the summer months. In the winter its genial rays scarcely ever bless them at all. It was at one time supposed that goitre was produced by the use of snow-water, but now it is known that it results from the excessive humidity of the atmosphere, in consequence of the exclusion of the sun. Sometimes a cyst forms in the thyroid body, which is called hydrocele of the neck, and which can only be cured by an operation. In such cases fluctuation is distinct. The character of the tumor can be determined by the exploring needle, and when the presence of serum is positively ascertained, an incision should be made, and the wound kept open by the introduction of a tent, so that it shall not heal until the cavity is obliterated. This is always a serious operation, and one that is followed by great constitutional disturbance. I am, however, from long experience, convinced that the operation which I propose is more safe than any other, and more successful, and indeed the only method by which the disease can be cured. I have operated successfully four times, once in South Carolina, and three times in California. I have never lost a patient, although one was told that he should make his will, as death would result from hæmorrhage so soon as an incision was made. This man had taken two or three pounds of iodide of potassium, had applied the tincture of iodine externally, and all without the slightest benefit having resulted, and yet the difficulty was removed without much risk, and without either general or local treatment, except the operation. Sometimes the thyroid body becomes enormously enlarged, and is so formidable in its vascular proportions that few surgeons have felt that they were justified in endeavoring to remove either the thyroid gland or any portion of it. It can be distinguished from any other tumor upon the neck by the fact that it always follows the movements of the trachea in the act of deglutition. In ordinary cases of goitre, as has been determined by the experiments of Coindet and others, iodide of potassium is the only remedy that will prove effectual. This article should be given internally, and the tincture of iodine and arnica applied externally, morning and evening. The tincture of iodine alone is too irritating, and consequently should be combined with an equal quantity of the tincture of arnica; two or three coats should be applied with a camel's-hair pencil, at intervals of five minutes, until

severe irritation is produced. During the use of this external irritant, give from five to ten grains of the iodide of potassium three times a day, either with syrup, the fluid extract of stillingia, or the syr. of sarsaparilla, according to the judgment of the practitioner and the taste of the patient, which we are often obliged to consult, even in cases in which much more depends upon the virtue than upon the taste of the medicine. Sometimes when the thyroid body becomes enlarged, its substance loses its vascularity and softness, in other words, the body of the thyroid gland on one side becomes solid, and presses so much upon the trachea that respiration becomes difficult, and an operation is necessary in order to prevent suffocation, which is otherwise unavoidable. If you cannot remove a tumor of this character by internal and external applications, then if suffocation be threatened, it is important, and indeed becomes imperative upon a surgeon to make an effort to save a human life, even at the expense of a reputation, and perhaps a tedious lawsuit. There are only a few surgeons who have operated, and I cannot now name those who have operated successfully with the ligature; but it is the only method by which a tumor of this character can be removed successfully. I some years since operated upon a case of a calcareous enlargement of the right lobe of the thyroid gland. In South Carolina, in 1835, I had a case of this character. At that time Dr. Wells and I were unable to determine the character of the difficulty, although we were fully aware of the danger of such an operation, and were so unwilling to undertake it, that the friends, as an inducement, offered to pay extravagantly if we succeeded. I had only left Paris a few months before, and Dr. Thomas Wells evidently did not favor the operation, and I was therefore requested to perform such a one as might be required. I said to Dr. Wells, after I had made a few incisions, that the growth did not present the appearance of an ordinary tumor. I then made another incision, deep but short, from which the blood poured in a fearful stream. Dr. Wells arrested the hæmorrhage with his finger and thumb, and I surrounded the tumor by a strong ligature. The patient recovered, and I am glad to say that the result added to the reputation of both Dr. Wells and myself.

Wounds of the chest, particularly superficial wounds, do not differ from those on any other portion of the body, and whether they be longitudinal or transverse, provided they are incised, they

should be closed by the interrupted silver suture, and dressed so as to secure union by the first intention. Penetrating wounds are always serious, and the principles of their treatment should be well understood, as no time is allowed for preparation. Whenever a sharp-pointed or cutting instrument wounds the lung sufficiently to allow the air to escape into the pleural cavity, the lung collapses by reason of the external pressure, and consequently ceases to perform

Fig. 73.

its function. This, however, need not be regarded as very serious. Close the external wound; the air by which the pleural cavity was filled will soon be absorbed; the lung will expand, and perform its function just as well as before the receipt of the injury.

I repeat that whenever there is a wound sufficiently extensive to permit the air to escape into the pleural cavity the lung collapses. All that you are required to do is to close the external wound, apply a compress and bandage, and in twenty-four hours the air will disappear, and the difficulty be removed, provided the injury is not followed by pleurisy. When the inflammation of the pleura is not acute, the effusion of either serum or pus may occur. The former is called hydrothorax and the latter empyema. They produce the same temporary difficulty that is experienced in emphysema, although they are both of a much more serious character. I claim to

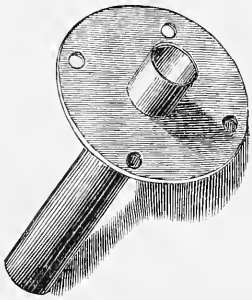
have been the first to point out the correct method of treating such cases, and I have been successful by pursuing the course which I will now describe.

Inflammation either of the pleura costalis, pulmonalis, or of the substance of the lungs, may produce a secretion of either pus or serum; the latter can generally be relieved by counterirritation and diuretics. Should, however, this course fail, and the air still enter the lung, or, in other words, if the bronchial tubes are pervious, the fluid should be gradually drawn off with an aspirator, so as to diminish the pressure sufficiently to favor the expansion of the lung. A case occurred in this city recently, in which not the slightest respiratory murmur could be detected, on account of an effusion of serum, which was not removed. A post-mortem proved that the lung was not larger than a man's fist, and perfectly solidified, not a single air-tube being found pervious.

In 1835, Dr. McQueen, of Sumpterville, South Carolina, placed himself under the care of Dr. Wells and myself. He had an accumulation of pus in the right side of the chest; a large quantity was discharged when the trocar was introduced; the entire contents of the cavity were not allowed to escape, and then the wound was closed carefully for fear that the air might, if admitted, produce serious consequences. Being the junior partner, I was required to dress the patient every morning. Finally the opening enlarged by ulceration, and the matter discharged constantly, and contrary to the expectations of both the physicians and friends, the cavity cleared and the doctor regained his health. Recollecting the result in this case, as well as the cause, I adopted a similar course of treatment in the case of Captain Chase, who had been in the United States Marine Hospital for more than two years, without the slightest improvement, and without the shadow of a hope of recovery. The opening had been made, through which the pus escaped two or three times a week. By pursuing such a course a cure was impossible, because the cavity could not close unless it was kept empty, consequently I had a tube made, such as is represented in Fig. 74, this being inserted. The stopple was removed every two or three hours, the cavity gradually contracted, and the discharge finally ceased. The patient, when I left the hospital, was the porter of the establishment, and enjoyed as good health as any man in the institution. Watson said that there was no established method of

treating such a difficulty. A case was never cured except by accident until the method described was adopted, which was three years before the drainage-tube was employed either in France or

Fig. 74.



England, as I proved by an article published in the *Pacific Medical Journal*, by my nephew, Dr. Cameron, of Red Bluff, California.

In the case of a man from Nevada, California, the ribs were fractured by a pistol-ball which entered near the sternum on the right side, passed through the right chest, and escaped at the angle of the ribs, by which one was injured. When I saw him there was about a gallon of pus in the cavity of the right pleura, which, with other foreign bodies, was removed. The anterior portion of the diseased rib was first removed, allowing the pus to escape. The respiratory murmur was audible at the upper portion of the lung. The tube was inserted the second day, and the cavity kept partially empty for the purpose of enabling the lung to expand, and the cavity to close. On the second day after the operation some pieces of cloth and one piece of bone escaped with the pus, which would without any other cause have prevented the recovery of the patient. By passing a straight silver sound about a foot in length, I detected the diseased bone on the inside and posterior part of the chest, and succeeded in removing it without much difficulty, having waited until the fever had subsided. The discharge greatly diminished and the lung considerably expanded. This operation was followed by the most satisfactory result. The patient improved daily, and in two or three months he obtained the situation of doorkeeper at Adams's Museum, near the City Hall, and remained there until he

had recovered sufficiently to return to his native State, Illinois. I received a letter since, which stated that he continued to improve, and was living with his parents, in perfect health. I have operated repeatedly in cases of empyema resulting from pleuritis, in gunshot wounds, and have never failed, except in cases produced by the rupture of the cavity caused by the disintegration of tubercles into the pleural cavity. The result in such cases has not been so satisfactory as to incline me to operate again. There was one case of empyema in which the result was so extraordinary that I will mention it in detail. A young man, who lived in Virginia City, received a gunshot wound, the ball passing under the clavicle and lodging in the right lung, about four or five inches below the point of entrance. An abscess formed, the contents of which escaped about every two weeks by the mouth. Having ascertained the extent of the cavity by percussion and auscultation, an incision was made between the fourth and fifth ribs. A trocar was passed, which fortunately entered the lower extremity of the sac, and the contents escaped through the opening. A tube was then inserted and worn for four or five months, and indeed until he was perfectly cured. I met him a few years ago in this city, and he was enjoying perfect health. I operated upon another patient in the same condition, as the result of a gunshot wound of the left side. The cavity was opened, the tube was inserted and retained until the patient was entirely well, and he was afterwards employed as a nurse in the County Hospital. The drainage-tube which I employ was in use, and the cases were published, three years before that course of treatment was practiced or suggested by any other physician, and it is possible that the *Pacific Medical Journal* may have found its way both to France and England. Facts are simple, and after a discovery is made we are astonished that it had not been thought of before. Velpeau, in his work on operative surgery, did not recommend the removal of the ribs, and doubted the propriety and even the safety of such operations. I removed two ribs in the following case: A man belonging to a hunting party, encamped not far from Los Angeles, returned to the camp at night without giving the sign agreed upon, and one of his friends shot him with a rifle; two ribs were wounded, and the ball passed between them, but escaped without wounding the pleura on the opposite side of the chest, which is the reason that it was not

fatal. I have operated repeatedly in cases of this character, and have never had reason to regret having done so. When the lung is injured the external wound should not be closed. The blood should be allowed to escape externally, to prevent an accumulation in the cavity of the chest, which would produce much more serious consequences. Should the external wound be too small for the escape of the blood, and if you have ascertained by percussion and auscultation that it has accumulated in the cavity, either the original wound should be enlarged, or another made at a more convenient place, to allow it to escape. In such cases the patient is generally unable to lie down, except on the injured side. The function of the lung on that side being destroyed, if the other should be embarrassed by position, as much air would not enter the lung as the system requires. In such cases the respiratory murmur is absent, and there is a want of resonance on percussion. There is another symptom which is seldom absent, and that is retention of urine; when the posterior portion of the lung is wounded, I have almost always found it necessary to use the catheter for several days. Sometimes suppuration results from the presence of blood in the chest, and then you must treat it as already recommended.

Emphysema results from a wound of a lung produced by a fractured rib, or other causes, so as to allow the air to pass into the subcutaneous cellular tissue, by which it sometimes becomes greatly distended, and one-half of the body very much disfigured. One of the most extraordinary cases I have ever seen was produced by an operation which I performed some years since upon a young man who had a cavity in the left lung, which discharged into the pleural cavity, and the pus accumulated so much that when he would shake his body quickly one could hear the fluid splash from side to side like water in a half-filled barrel. Having been very successful with the drainage-tube, I decided to open the chest, draw off the pus, and allow it to escape gradually, hoping that if the case was not cured, temporary relief might be afforded.

When the external opening was made and the contents discharged, the air escaped at every inspiration, there being a connection between the external wound and the bronchial tubes. I inserted a tube, closed it with cork, dressed it as usual, and in three hours I was sent for and found that one side of his body was enormously swollen. A firm compress was applied, the tube removed, and the skin was

pricked in different places, which with friction was sufficient to remove the difficulty in a very short time. On passing the hand over a part similarly affected, a noise is heard, which results from the passage of the air from cell to cell. Empyema is a collection of fluid in the pleural cavity, and emphysema and pneumothorax are produced, the latter by the escape of air into the cavity of the pleura, and the former into the subcutaneous cellular tissue, which gives rise to the symptoms detailed.

Pneumothorax may be easily distinguished by the increase of resonance. It is rarely serious; for when the wound heals the air is absorbed, and the difficulty of respiration disappears. When accumulations of pus or serum take place in the chest, and resist the ordinary methods of treatment, you can calculate with confidence that in eight cases out of ten the treatment indicated will prove successful. Make an opening above and near the body of the rib, insert the tube described, empty the sac every two or three hours; the cavity in ordinary cases will gradually close, and the patient be restored to health. But in cases of a strumous character, neither this nor any other treatment can be followed by a satisfactory result.

LECTURE XXXIII.

GENTLEMEN: I shall to-day direct your attention to wounds of the abdomen. When the peritoneum is not injured, these are not more dangerous than superficial wounds of any other portion of the body, and hence do not require special treatment. When, however, that membrane is wounded, they are extremely dangerous, more or less so according to the extent and character of the injury, or, in other words, to the importance of the other organs implicated. A wound of the abdomen may be either punctured, incised, or lacerated.

A punctured wound is as serious as any other, when the peritoneum and other important parts are involved. An incised wound is generally more extensive, and when the intestines are injured they will require such treatment as will hereafter be indicated. Lacerated wounds are almost always produced by firearms, and of course are both lacerated and punctured. They are more dangerous than incised wounds of the same part, and although not always fatal, as will hereafter appear, they generally are followed by that result. The peritoneum is a serous membrane, and therefore inflames readily, which explains the great danger of all the injuries sustained by it, however produced. There is seldom much hæmorrhage in wounds of the abdomen, by reason of the pressure made by the contraction of the abdominal muscles being sufficiently great to close the wounded vessels. When it does occur the blood generally escapes externally.

When the intestines are wounded, the case presents a serious aspect. Blood is mixed with the alvine discharges, while fæcal matter and blood pass through the wound. I treated a case a few years ago which was one of the most disgusting and discouraging that I have ever met with. Two drunken Irishmen were fighting, when one stabbed the other, making with a knife a wound four or five inches in length, through which the wounded intestines protruded. The man wore a flannel shirt and drawers; after he had received the wound he went to the privy, and was found there with a mass of the intestines as large as a fist protruding, and covered

with sand and wool from his drawers and shirt. It was late at night; and after two or three hours had been spent in the removal of the extraneous matter from the protruding parts, I closed the wounds, both in the intestine and in the abdominal parietes. This case terminated unfavorably, as will almost every case of this character. The wound of the abdomen was closed by the interrupted silver suture, after the edges of the wound of the colon (which was the intestine injured) had been inverted, and the serous surfaces brought in contact by the interrupted silk suture; but the patient died of peritonitis in twenty-four hours after the receipt of the injury. In simple wounds of the abdominal parietes, the silver suture should be used. Should the peritoneum be wounded, and the intestines uninjured, the latter should be returned, and the wound closed as previously directed. In closing wounds of the abdomen, the needle used should not injure the peritoneum, although it should pass as near the bottom of the wound as possible, in order to secure union by the first intention, and the ligatures or sutures should be allowed to remain six or seven days. Should inflammation follow such an injury, the case may be absolutely hopeless from the outset; but if not, it may be proper to abstract blood both generally and locally. Calomel and opium should be administered to relieve pain and promote secretions from the important organs, as well as to obtain the specific effect of the former, provided the consequences of the injury are protracted, or in other words become chronic. Many physicians, both in this city and elsewhere, are opposed to the use of the lancet, because they have not sufficient independence and self-confidence to withstand public opinion.

There are two reasons why we do not bleed as much as we did formerly; the first has been mentioned, and the second is that we have depressants, which in six or eight hours will reduce the pulse to its natural standard, where it can be kept by a continuation of the remedies. Consequently when the symptoms are not very urgent, they can be relied upon; but when the inflammation is acute, depressants do not relieve the capillary vessels so effectually as venesection. Resort to both, and apply the warm-water dressings; prevent evaporation by the use of oiled silk and a bandage, which I consider preferable to any other application in such cases.

The serous membranes adhere readily if brought and retained in contact, plastic lymph will be secreted, and the wound will close in

a shorter time than is required by any other tissue or tissues of the body. The edges of wounds of the intestine must be inverted; the serous surfaces are thus approximated, and may be retained in contact by the interrupted silk suture. Lymph will soon be secreted to cover the sutures, which will pass into the cavity of the wounded intestine, and in a few days no inconvenience will be experienced from the injury. Do not forget that the edges of a wounded mucous membrane, when approximated, will not heal by the first intention, because the stitches will be thrown off by ulceration before union takes place.

When an intestine is wounded, allow me to repeat, remove all foreign bodies from the protruding part, invert the edges of the wound, hold the serous surfaces of the wound in contact by the interrupted silk suture, return the part into the cavity of the abdomen, close the external wound as before directed, and then make hot applications, and administer the remedies already specified. The profession is indebted to Jobert, of the St. Louis Hospital, for this method of treating injuries of this character. I have made many experiments upon the lower animals, and have treated wounds of the intestine of the human species by pursuing this method with great success. One night, in this city, I was called to see a man who had received a wound of the abdomen. Fæcal matter escaped from the wound, but the opening was not sufficiently large to allow the intestine to protrude. It was enlarged, the wound in the intestine was exposed and closed, and the patient recovered without experiencing any serious inconvenience from the injury. I have treated other cases in my native State with the same result. The diet should consist of chicken-water, corn-meal gruel, or milk, if preferred. Nothing should be allowed that can distend the intestines, and the bowels should be kept constipated for four or five days, and then opened by an enema composed of an infusion of ℥j of senna to the pint of water. Dr. William Bettson, of Colusa, gave me the particulars of a case that occurred at the battle of Gettysburg. A rifle-ball passed into the abdomen above Poupart's ligament, and the next day was discharged by the rectum, and the man suffered no more inconvenience than would have resulted from a gunshot wound of the abdominal parietes. Beaumont, of St. Louis, treated a very remarkable case of wound of the stomach, and made many experiments which were exceedingly valuable to the profession.

The bladder is also liable to be wounded. Injuries of this character have always been regarded as fatal. That opinion I entertained until about four years ago, when one morning I met the class at the County Hospital, and was told that a man had been admitted with a wound of the bladder. The incision was three inches long, in the centre of the abdomen, and the urine was flowing through a large silver catheter, introduced by the nurse when he was admitted. I had a few days before told the nurse, that if a patient with a wound of the bladder should be admitted during my absence, he must introduce a No. 6 or 8 silver catheter, secure it, and keep the patient upon the side until I arrived. The nurse had treated the case as I directed. The patient's position was changed from side to side, and in less than two weeks he had recovered sufficiently to leave the hospital. Unfortunately he was murdered a few weeks later, at Sacramento, by one of the fast men of that city. Wounds of the bladder have been regarded as incurable, because of the risk of urinary infiltration, which when extensive is almost always fatal. This difficulty occurs occasionally in California, by caves and the detachment of boulders in tunnels. The consequences of such injuries will be considered elsewhere.

In cases of infiltration of urine, no matter how produced, in order to save the patient, numerous punctures should be made with a lancet, and the urine forced out through the openings. Use cloths, wet with warm water, and sufficient pressure to force the urine out, for if it remains, mortification and death must follow. When affections of the abdominal cavity were under consideration, I mentioned the operation of paracentesis abdominis, but did not describe how it should be performed. It sometimes becomes necessary to remove serum from the peritoneal cavity, produced either by inflammation of that membrane or by induration of the liver or spleen, or both, by which the circulation in the capillaries is disturbed. They become congested, an increased secretion takes place, more than is necessary to supply the parts, it accumulates, and is then called dropsy. When the accumulation becomes so great as to cause distension and inconvenience in breathing, if it cannot be removed by diuretics, you should perform the operation of paracentesis abdominis, which consists in passing a trocar and canula through the abdominal walls. The serum will flow through the canula until the fluid has all escaped, when the wound should be closed by a strip of adhesive plaster

and a bandage. The trocar should be inserted either at the centre, between the umbilicus and pubis, in the linea alba, or at the mid-point of a line drawn from the anterior superior spinous process of the ilium to the umbilicus. Both are equally safe. The execution is simple, but always be sure that you are right, because you might perform the operation of dry tapping, and that would be exceedingly unpleasant. When I was a medical student this was considered a great operation. I rode fifteen miles to see it performed, and when we reached the place the patient was sitting in a large armed chair, in the shade of a large oak tree near the house, for the accommodation of the five or six hundred people who had assembled to witness this surgical achievement. How things have changed!

Before performing this operation, be sure that you have a case of abdominal dropsy. Sir Astley Cooper gives a case that occurred in London. The physician of the patient thought he had a case of ascites, passed a trocar through the abdominal parietes, and as no fluid followed the withdrawal of the trocar, he said, "Gentlemen, you have witnessed the operation of dry tapping, which you may never see again." The students of the Toland College once enjoyed that privilege in a medical ward in the County Hospital. When fluctuation is not distinct, in other words, if, the left hand being placed upon one side of the abdomen, and the other side gently percussed with the right, a wave of fluid is not felt to strike against the place covered by the left hand, you should use the exploring needle, by which is meant either a simple grooved needle or the small trocar and canula, which I have used in diagnosing abscesses of the liver and deep-seated abscesses in other portions of the body, as well as ascites. I can say to the strangers in this class, that I have never made a mistake in my life in the diagnosis of either serous or purulent secretions. Should the tumor be of a different character, the use of the exploring needle will not be followed by any serious inconvenience. Sometimes an effusion of serum takes place between the skin and the abdominal parietes, or a superabundance of fat might be mistaken for dropsy. But, gentlemen, I now caution you to always be careful not to mistake a case of ascites for ovarian dropsy or tumor.

After the operation of paracentesis abdominis, a tight bandage should be applied, and stimulants administered until the patient becomes accustomed to the absence of the distension.

Children frequently put foreign bodies into the nose, and some-

times the efforts made by the friends render their removal very difficult. To remove such obstructions there is nothing better than a pair of small curved forceps, and when the substance cannot be grasped or removed by means of a director or hair-pin, I always take a director, pass it above the foreign substance, and press it down into the inferior strait, from which it passes into the throat, and is thrown out or swallowed, when the nose is relieved. An anæsthetic will greatly facilitate such operations, and as in such cases the patient is very apt to make all the resistance possible, he must be entirely under the influence of chloroform. When the forceps are introduced, and you are ready to take hold of the bean, bud, watermelon-seed, or grain of corn, the slightest motion of the head will defeat or prevent the success of the effort. I generally give the chloroform myself. The arms are tied to the arms of a strong barber's chair, which I have always kept in my office. The body is made fast to the back of the chair by a strong bandage, then I hold the head firmly, so that my assistant can take hold of the body and remove it, if removal is possible, and if not, I pursue the course of treatment already indicated. I would rather perform any capital operation, particularly at night, than remove a glass button or any other smooth, hard, oval, or round substance from the nose. The friends are not satisfied to have it pushed back into the throat, and hence you should always endeavor to present it to them.

There is another difficulty of the nose which is sometimes annoying, and occasionally dangerous, I mean epistaxis or hæmorrhage. The instrument exhibited is called Bellocq's sound, which is intended to enable you to plug up the posterior nares in obstinate cases of hæmorrhage. A ligature is attached to a piece of sponge large enough to fill, when wet, the posterior nares. The sound is passed through the nose, behind the soft palate, and into the mouth. The sponge is attached to the extremity of the sound, and drawn into the posterior nares, and retained there until the danger of a recurrence has subsided. After this has been secured the external nares should be plugged either with lint or cotton, and then it is impossible for the hæmorrhage to continue. I have practiced a long time, and have had this instrument about thirty-five years, but I have never found it necessary to use it. I have loaned it frequently, but never found it necessary in any case I have treated. In order to demonstrate what I mean, some years ago, about five o'clock in the afternoon, I was

called to see a patient at the Lee House, who, they said, was bleeding to death from the nose. I found three or four physicians present, and they could not arrest the hæmorrhage. I took with me some powdered alum and a roll of lint. So soon as I arrived, the lint, after being wet, was covered with the powdered alum, and inserted into the superior strait of the nares, and packed firmly. The hæmorrhage ceased instantly, and the man they thought would be sent home a corpse, is now living, and survived his expected funeral at least fifteen years. Pulverized bluestone or sulphate of copper answers the same purpose. It is more painful than alum, and is not so effectual as the persulphate of iron, or Monsel's salt, which I introduced many years ago as a powerful hæmostatic. I claim the credit of being the first in America who introduced the remedy, and who published an article in a medical journal describing its properties. When you have a case of hæmorrhage from the nose, which has resisted the ordinary remedies, take strips of lint half an inch wide, and wet, cover them with Monsel's salt, and pass them into the superior strait, plugging up the external nares, at least the side from which the blood escapes, and the hæmorrhage will not return. The hæmorrhage almost if not always comes from the superior strait. I apply my local remedy there, and I have never been disappointed. Should blood flow from the other nostril, this should also be plugged with lint covered with Monsel's salt, and the hæmorrhage can always be controlled without the use of Bellocq's sound. You should not rely upon stopping the nostrils externally, for the blood will pass into the throat. Pressure must be made upon the bleeding vessel, and I repeat that it is usually found in the upper part of the nose, and from my experience I might say that it always is when the hæmorrhage does not result from an injury.

Foreign bodies, such as glass buttons, beads, beans, or grains of corn, or anything that is small enough, may be found in the ear, and occasionally great difficulty will be experienced in their removal. Some years ago, a boy, four or five years of age, put a glass button, thick in the centre, thin at the edges, and perfectly smooth, in one of his ears. It could be easily seen and felt, but in consequence of some peculiarity it was impossible to render him sufficiently insensible to touch his ear without his knowledge. Finding that the ordinary forceps slipped, I had the blades of the most approved apparatus covered with chamois leather, and still it

could not be removed. It was finally removed by placing the patient on that side and throwing a stream of tepid water into the ear until it was washed out. The chloroform given came very near proving fatal; the boy appeared to be in a stupor for several days, and was kept alive by stimulants, administered every two or three hours until the stupor disappeared and the vomiting ceased. The pulse for two days was 40, and he exhibited all the symptoms of protracted anæsthesia, which convinced me that the use of chloroform becomes dangerous in proportion to the length of time it is administered.

LECTURE XXXIV.

GENTLEMEN: This lecture will be upon the nose and ears, and I will direct your attention to polypus, which is a growth that forms in the nose, and of course, when it becomes large, obstructs the passage and renders respiration difficult. There are three varieties: 1st. The mucous; 2d. The fibrous; 3d. The medullary. The mucous polypus is soft, sometimes transparent, and occasionally presents a slightly reddish appearance. It is soft and yields to very slight pressure, but sometimes it can be removed entire. It appears to be a hypertrophy of the mucous membrane, and the attachment or pedicle is usually small.

The fibrous polypus is entirely different; it is as solid as an ordinary fibrous tumor, and when it acquires considerable magnitude it passes into the throat, behind the soft palate. The medullary polypus grows rapidly, bleeds readily, and is almost always painful, and is generally accompanied by the symptoms that usually attend malignant diseases.

Mucous polypi are easily removed, but are very liable to return. I have found since Monsel's salt was discovered, and for the first time used in this State, that the best method of treating mucous polypus of the nose is to pass a director covered with wet lint, saturated with Monsel's salt, into the diseased nostril; by the passage of the lint the polypus is broken down, and by repeating it a few times the difficulty disappears. The treatment with lint and Monsel's salt has superseded the use of the polypus forceps, which I never employ except in cases of mucous polypus of the uterus, which are easily removed and their return prevented by the use of Monsel's salt.

I have treated but one case of fibrous polypus of the nose. In that case the tumor commenced in the nose, and as it enlarged it passed backward behind the soft palate, and extended about an inch below the uvula. Deglutition was extremely difficult, and it be-

came necessary, to prevent death from inanition, to perform an operation by which the tumor could be removed, but which my partner, Dr. Thomas Wells, contended would prove fatal by hemorrhage. He thought the hæmorrhage could not be arrested by any means within the control of the profession. I had a pair of strong forceps made, with teeth, and curved so as to pass up behind the soft palate, which was thrown forward by the pressure made by the tumor. They were strong enough not to yield if my entire strength was applied. The forceps was passed up behind the soft palate, and the tumor was grasped as near the base as possible. Before removing the tumor, after the application of the forceps, I had a wash-basin filled with a saturated solution of the sulphate of copper, in which was a quantity of lint. When the tumor was removed the hæmorrhage was frightful, until it was arrested by plugging up the posterior nares with lint, saturated with the solution of the sulphate of copper. The soft palate had been displaced so much that I could pass my finger behind it and fill the cavity so effectually that hæmorrhage could not under any circumstances continue.

Malignant polypus is a very different disease; when removed with the polypus forceps it generally bleeds freely, and is very liable to return. Some years since I treated a case from Calaveras County. I removed the tumor three or four times, but the patient only experienced temporary relief. I then proposed to make an external incision for the purpose of removing the bones that were implicated, but having friends at the East, he concluded to visit them and then enter a public hospital, and submit to the treatment recommended.

There is another difficulty of the nose which occurs occasionally, and is frequently very obstinate, which is ulceration of the septum. This is a disease of a strumous character, and commences in the mucous membrane, and when that is destroyed by ulceration, the cartilage is absorbed and communication is established between the nasal cavities. Deformity of the nose seldom occurs, and I think the disease can be generally arrested before the destruction becomes extensive. I have succeeded in arresting this difficulty by the use of both the iodide of potassium and iodide of iron, in the shape of Blancard's pills. As a local remedy I prefer the chlorate of potassium; a saturated solution should be applied two or three times a day with a camel's-hair pencil. With the iodide of potassium I sometimes

combine the fluid extract of stillingia, which during the war I was compelled to abandon in consequence of the price, as it is indigenous to the South. Another and perhaps the most formidable disease of this organ is lupus, formerly called noli me tangere, which means don't touch me, because, if you do you cannot increase your reputation by effecting a cure. The disease originates in the sebaceous follicles of the face, and it often extends until the nose as well as other portions of the face are destroyed, and is the cause frequently of ectropion when the ulcers heal. Females are more liable to it than males. The skin becomes inflamed and at length ulcerates, and the ulcer has a tendency to enlarge constantly and sometimes rapidly, and often before the disease can be arrested permanent deformity may result. The best internal remedy is Fowler's sol. of arsenic with senna. ℞. Fowler's sol., ʒiv; fluid ext. senna, ℥iij; syr. simplicis or zingiberis, ℥iiss. Misce. Sig. Give one teaspoonful three times a day, in water, after meals. Fowler's solution should be applied to the edge of the ulcer two or three times a week until its progress is arrested. Some authors recommend four grains of arsenic to a quart of water to be applied morning and evening. I have used nitric acid with a decidedly good effect. Take a redwood stick about the size of an ordinary lead-pencil, dip the end into nitric acid, and touch the ulcer four or five times at intervals of three days; allow it to remain two or three minutes, and then wash it off with cold water. This treatment, when applied to any painful or irritable ulcer, relieves the pain more speedily and effectually than any other. The ulcer should ordinarily be dressed with simple cerate.

There is another difficulty of the nose which is occasionally met with, and that is hypertrophy; it is generally called a whisky nose, yet it sometimes occurs in persons who never have indulged in the use of any alcoholic stimulants, of which beer is the most injurious. The nose enlarges until it acquires three times its natural magnitude. This enlargement is due simply to an increased development of the cellular tissue. This disease may be hereditary. One of the judges of the Supreme Court of this State has transmitted it to about two-thirds of his children. This is a subject to which I refer very unwillingly, but it is of so much importance that I cannot pass it over with only stating the facts. A hint to the wise is sufficient.

If my nose presented that appearance I would have it diminished in size, and no serious consequence could result from the operation.

The skin of the nose should be divided in the centre, and the excess of subcutaneous cellular tissue should be removed, so as to reduce the organ to its natural size. The patient would not be much disfigured, and very little risk would be incurred by such an operation.

Children often suffer from tympanitis; in such cases, if they be neglected, the tympanum may ulcerate, and the hearing be permanently impaired. I now wish to impress upon every student in this college the necessity of applying leeches when otitis exists. The number should depend upon the violence of the pain and the age and constitution of the patient. After the abstraction of blood, a blister, or rather Birt's blistering fluid, should be applied behind the ear or ears, and when the true skin is denuded, from a fourth of a grain to a grain of morphia, according to the age of the patient, should be applied to the raw surface morning and evening until the pain subsides; should it be violent, apply paper wet with strong ammonia; apply it to the temple, place a four-bit piece over it, press firmly upon it for about five minutes, and then the cuticle can be removed and the morphia applied, which may be repeated three or four times a day. In tympanitis the hearing when neglected should not be entirely lost. In such cases an examination may be made either with the auriscope or by sunlight, which is much more satisfactory. In cases which have been neglected, and in which ulceration has already occurred, all that can be done is to control the inflammation by leeches, blisters, and the use, if a discharge exists, of sulph. aluminæ, gr. xij; vin. opii, ʒij; aquæ destil., ℥ij. Misce. Sig. Put ten or fifteen drops in the ear morning and evening, or three times a day, as may be indicated. Should the tympanum even be perforated, if the bones of the internal ear be healthy, and retain their natural positions, the hearing may be injured, but not necessarily destroyed, and will remain sufficiently perfect for ordinary purposes. When, however, the Eustachian tube is either obstructed or closed by disease of the mucous membrane, then a stricture may exist. After the acute inflammation subsides, metallic bougies should be employed to remove the stricture. After inflammation of the ear has continued for some months, occasionally mucous polypi are produced, which are very liable to return after they have been removed. Remove them with the forceps, and apply a small piece of lint wet with ether the saturated solution of Monsel's salt, or the salt itself, to the diseased surface. Some prefer the nitrate

of silver, which I have found frequently effectual in preventing a recurrence of the difficulty. The gums, particularly of the inferior maxillary bone, are liable to tumors or excrescences, which are firm, whitish, and irregular, and if allowed to remain, finally become cancerous. Since I have lived in this city I have treated four cases. The tumor, including the gum, should be removed with a gouge, and the actual cautery applied. The periosteum is the seat of the difficulty. When that is destroyed, and the bone exfoliates, the disease will seldom return. I operated upon a case of this character, which involved the alveolar process of the lower front teeth, and they were loose. I removed the diseased substance entirely with bone-forceps, including both the soft parts and bone, with the alveolar processes. The recovery of the patient was entirely satisfactory. He subsequently obtained a set of false front teeth, and was not disfigured.

Besides the diseases mentioned, the maxillary bones give rise to three varieties of tumors: the medullary, cystic, and fibro-cartilaginous. The first is cancerous, and unless you remove the entire disease the difficulty will return; often, too often I am sorry to say, it will do so in spite of your utmost care. Cystic tumors always form in the interior of the bone. When they appear in the inferior maxillary it generally enlarges, and the pressure causes an absorption of the surrounding bony tissue, which ultimately becomes very thin, so thin, indeed, that it can be cut with a scalpel. When cystic tumors form in the antrum highmorianum, and have enlarged until the surrounding bony tissue has been absorbed, an incision should be made upon the inside of the mouth, through the shell of the bone that remains, and the tumor removed with the forefinger of the hand that is most convenient. In 1846, in Columbia, South Carolina, I removed a tumor of this character from the antrum, on the left side, by making an incision the entire length of the enlargement, and picking out the tumor with the forefinger of the left hand. The patient recovered rapidly, and the disease had not returned four years after, when I left the State. In California, three more cases were operated upon in this manner, with a similar result. By pursuing this course you avoid making a cicatrix on the face, which would disfigure the patient.

When the tumor is of a fibro-cartilaginous character, you will be obliged to make an external incision, in order to expose and remove

it. I have never removed a tumor of this character which returned. But when they are of a medullary character, they almost always return. Still you cannot, during the early stages of the disease, avoid such an operation, though you may feel satisfied that it will be unavailing. The disease may not return for a long time, and if it should, it may attack an internal organ, and when it proves fatal the surgeon will not be accused of homicide, nor will the patient be subjected to the inconvenience that necessarily results from a cancerous ulcer.

In 1835, I removed half of the inferior maxillary bone for a fibro-cartilaginous tumor, in Columbia, South Carolina. The boy was twelve years old. I performed the operation by the request of Dr. Davis, of Columbia, the most prominent physician of that town. The entire jaw from the articulation to the chin was removed, a strong ligature being passed through the tongue, lest retraction of that organ should occur, which it was supposed would prove fatal. When I left the State the patient enjoyed good health, and experienced but little inconvenience, except from the want of teeth; he was very slightly deformed. I have performed many operations of a similar character, one of which, for the removal of the entire inferior maxillary bone, will be given when the diseases of the bones are under consideration.

Ulceration of the mucous membrane of the mouth may result either from syphilis or from gastric derangement. The former will be considered when that class of diseases is presented. The ulcers may appear upon the tongue, the mucous membrane of the mouth or the throat. Any preparation of mercury will produce ulceration of the mouth, but the ulcers present a blackish appearance, and those resulting from gastric disturbance are generally yellowish. They are equally painful, but require very different treatment. In mercurial ulceration of the tongue, give iodide of potassium internally, and gargle with a saturated solution of chlorate of potash three times a day. I consider the chlorate of potash the best antiseptic we can employ. A few years ago I relied upon permanganate of potash. I have since tried carbolic acid, chloride of lime, and indeed every new remedy that has been presented, and I think that the intelligent members of the class at the County Hospital are all convinced, from the results in my wards, that the chlorate of potash is more effectual than any other preparation.

Sometimes the tongue is hypertrophied, and the only possible method of treatment is to remove a sufficient quantity of the organ to reduce it to its natural dimensions. Dr. Wells, my former partner, in Columbia, South Carolina, removed a hypertrophied tongue by the application of a double ligature, which was passed through the centre, tied firmly, and the portion anterior to the ligature was removed. The result was satisfactory. Should you meet with such a case, pass a four-strand ligature through the tongue on each side, and give the control of the ligatures to reliable parties. Take out a Y-shaped piece of the tongue, large enough to reduce the organ to its natural size, tie the arteries, which can be done without the slightest difficulty; the edges of the wound should be approximated, and retained in contact by the interrupted silk suture; the silver suture would prove a source of great annoyance.

The frænum sometimes extends to the extremity of the tongue, in children, and they are said to be tongue-tied. This is a matter that has annoyed me greatly; every idiotic child over ten years old, that does not talk well, is considered tongue-tied. I generally, in such cases, divide the frænum as far from the tongue as possible, and say to the friends that every child that can hear will ultimately talk; this will protect you from being subsequently annoyed. It is one of the simplest operations in surgery, provided you cut as far from the tongue as possible, so as to prevent the risk of hæmorrhage.

The tonsils are liable to inflammation, ulceration, and chronic enlargement. Inflammation of the tonsils is called cynanche tonsillaris. The glands sometimes become so enlarged that suffocation is threatened, and then an incision should be made upon both tonsils; since, by relieving the distension of the inflamed vessels, suffocation can almost always be prevented, and if not, the pus, so soon as formed, escapes through the incisions. By pursuing this course you can anticipate and prevent suppuration. I generally prescribe a gargle, composed of alumin. sulph., ʒiv; pulv. bol. Armen., gr. x. M. Put into a quart of water, and gargle four or five times a day.

When the difficulty is not controlled by the treatment recommended, an incision should be made upon each side of the uvula above the tonsil, and where the fulness or swelling is most prominent. This incision should be made with a tenotomy knife, or a small bistoury, or a lancet secured to a pencil or a redwood or pine stick, sufficiently strong to sustain the pressure or force necessary to make

the incisions. When the tonsils are enlarged and ulcerated, you should ascertain the constitutional peculiarities of the patient, and if delicate, give tonics, quinine with the fluid ext. of senna, nux vomica, or iodide of iron, and apply nitrate of silver to the ulcers three times a week. You should also order a nutritious diet.

When permanent enlargement of the tonsils exists, if the child is young, occasionally the swelling will disappear by the application of a saturated solution of alum, applied with a camel's-hair pencil, morning and evening. A chamois leather jacket should be worn over the flannel constantly, and a silk handkerchief should be tied around the neck, and removed in the morning, and such internal treatment should also be recommended as the symptoms indicate. When this treatment fails, the tonsils should be cut off. In cases of threatened suffocation, I have operated as early as one year, but although the operation was successful, I prefer, when possible, to wait until the child is three or four years old, and then if the tonsils are very large, only one should be removed, which will afford temporary relief; then at a future and suitable time the other should be excised. The tonsillotome is the instrument usually employed for this purpose. The patient is placed in an arm-chair, and secured either by straps or assistants. The tongue should be held down with a spatula. The instrument should be placed over the tumor, the points passed through, and the tumor removed by the circular blade concealed in the ring. I have only used this instrument a few times, and finding that a great deal of force was required to remove an indurated tonsil, I substituted the common dressing forceps and a probe-pointed bistoury, with a cutting edge about an inch and a half in length, and with that simple apparatus I can operate in a shorter time, more safely and more successfully, than even an expert can with the tonsillotome. Should the patient bleed much soon after the operation, cold water has always in my practice arrested the hæmorrhage. In two cases the hæmorrhage returned the second night. The first was a little girl twelve years old; she was relieved by the application of lint, wet with the tinct. mur. ferri, to the bleeding surface, which was held in contact with the wound about five minutes, when the bleeding ceased, and did not return. In the other case the Monsel's salt was used, and the lint was held in contact with the bleeding surface about five minutes; this arrested the flow, and the gentleman, who was then the public ad-

ministrator of this city, recovered rapidly. The teeth, although exceedingly useful and valuable, are sometimes very troublesome, and it is very important for young people to know how to preserve them. The child generally begins to cut its first teeth at the age of seven months, and when two years and a half old generally all the deciduous teeth have appeared. Two of the inferior incisors appear first, then the four upper incisors, followed by the remaining two below. Very soon after the eruption of the last already mentioned, the growth of four jaw teeth becomes evident by the fulness and tenderness of the gums at the point where they will ultimately appear. Should the child survive the irritation which results, at the age of two years and a half four more jaw teeth should be cut, which make twenty. They are called deciduous because they are displaced, and very soon others appear, which may decay and disappear very soon, or they may remain and perform their function for fourscore years. At the age of maturity, every human being should have thirty-two teeth. All of this you can learn from the professors of anatomy and obstetrics. But the question that now arises is, what is the best method of preserving teeth? When the permanent front teeth appear, they should be polished with pumice-stone. Take a piece of rattan or white pine, whittle it into the shape, or rather the width of a tooth, wet it with water, dip it into a box containing pumice-stone, and by gentle friction you can remove the natural roughness of the tooth, which causes it to decay. Sugar adheres to the rough surface, and is converted into lactic acid, which will destroy the enamel. By the application of pumice-stone the tooth is polished, nothing can adhere to produce a destruction of the enamel, and consequently the teeth will not decay, provided they are, after every meal, washed with cold water, and rubbed with a wet towel wrapped around the forefinger. My father died at the age of eighty; he had not a decayed tooth, had never used a tooth-brush, but always after every meal he went to the wash-stand, wrapped a towel around the forefinger of the right hand, dipped it into a basin of water, and rubbed his teeth until they were thoroughly cleaned.

Every child must be forced to take food that contains phosphates, or the bone-making material, and then the teeth, even the first, will be large and strong, and the second will be so perfect that with the use of a soft brush covered with Windsor soap, or a solution of bi-

carbonate of potash or soda, will cleanse the teeth without proving injurious to the enamel. A stiff tooth-brush should never be used. Professor Dudley recommended the students to use strong brushes. I followed his instructions, and very soon found that my teeth were gumless. I was compelled to abandon the stiff brush. If I had not I now would not have a single natural tooth. Always use a soft brush, or a cloth wrapped around the forefinger; have the teeth, when they are young, polished with pumice-stone. It sometimes becomes necessary to extract the teeth, because they are so much decayed that they cannot bear a plug, and after the tooth is extracted, hæmorrhage may follow, which you should know how to arrest. Take a narrow strip of wet lint, covered with Monsel's salt, pass it into the cavity left by the removal of the tooth, and force it firmly, and retain it a few minutes by pressure, and the patient will be relieved. A great many of the common people never wash their teeth when perfectly sound, and, in consequence, have an accumulation of what is called tartar, which separates the gums from the teeth; the latter fall out, and the parasites disappear when the accommodations are diminished. They cannot live without nutriment, and in such mouths they find all they need as long as the filthy teeth remain.

LECTURE XXXV.

GENTLEMEN: To-day I propose to lecture on the injuries of the brain, spinal cord, and nerves.

Concussion is a violent shock which may injure either the membranes or the cerebral substance itself. They may be either lacerated or their vital action disturbed. In some cases both conditions exist, and may be followed by inflammation. Concussion may result from either a fall or a blow upon the head. The symptoms vary, of course, according to the extent of the injury. I intend to illustrate what I have to say by cases, having had three or four recently which will enable me to explain the peculiarities of each variety. Some years ago I was superintending the erection of a quartz-mill, in Calaveras County, for a friend. Being in want of some materials to continue the work, it became necessary that I should go to Moquelumne Hill. I mounted a mule that had not been saddled for several months, and I wore a pair of Mexican spurs. Having dropped the reins to put on my gloves, I suppose the spurs touched the mule's sides, and she commenced bucking, as it is called by the Californians. I caught the reins, and they broke, and I fell backwards on a small stump, about four feet from the mule. I recollect regaining my feet, but was not conscious of anything that occurred until I was about two hundred yards from where the accident occurred. I was sitting near the road upon a rock of granite. How long I had occupied that position I am unable to say, and only became conscious after having my face and head bathed with cold water by one of the miners in my employ. The shock was slight; the function of the brain was only disturbed, without any organic lesion. After becoming conscious I had a fine donkey saddled, rode to Moquelumne Hill, and transacted my business as well as if the accident had not occurred, but was confined to bed for a week in consequence of the contusion I received by the fall. I have described the slightest form of concussion, which is only a disturbance which produces a temporary cessation of the function of the brain; sometimes the violence

offered is greater, and the insensibility may last for several hours; in this case the return of consciousness is almost always accompanied by vomiting, which should be regarded as very favorable. I have seldom lost a case in which consciousness returned in three or four hours after the receipt of the injury. I have endeavored to describe the symptoms you may expect to find in cases where there is simple concussion. When the injury is more serious, the state of insensibility remains, and the vomiting sometimes becomes very distressing. I recollect the case of a boy about ten years old, who fell from a piazza fifteen feet high, and struck his head upon a brick pavement; he was insensible about twelve hours. I gave him ten grains of calomel, which was the best remedy he could have taken under the circumstances. Cold applications were made, and when the calomel acted he became conscious and recovered rapidly. This was a more violent concussion. About two years ago I was called to see a female child about seven years old. She had been for some time in the habit of ascending the stairs on the outside of the railing. Although she was very active, on one occasion she fell about fifteen feet, and her head struck upon a mat that was in the passage. She was taken to bed in a state of insensibility. I was called soon after the accident, and found her pulse very quick and small. The breathing was sometimes very rapid and irregular, and sometimes very slow; the extremities were cold, the patient was entirely insensible, and the body was in constant motion. She was not only insensible, but was unable to take either food or medicine. Bottles filled with hot water were applied to the feet as well as to the entire body. She remained insensible from five o'clock in the afternoon until eleven at night. Consciousness then returned, with violent reaction; the body was hot, the pulse full and quick, and, to prevent inflammation, I opened a vein in the arm and abstracted at least a pint of blood; then I prescribed my depressant mixture, and continued it until the danger of inflammation had passed. I gave after venesection a strong mercurial cathartic, followed by the depressant already mentioned. Always after such injuries give calomel, at first in purgative doses, and then keep the liver acting by giving two grains of the ext. juglandis at night, so as to prevent abscess of the liver, which is always a serious complication.

This was a case of violent concussion of the brain, which would have proved fatal if it had not been treated so actively. This child

was not allowed to leave the house for four weeks, and was not exposed to any kind of excitement. In the case of the child of Mr. W., of this city, I thought there was laceration of the brain. The child was six or seven years old, and fell from a back piazza upon a brick pavement about fifteen feet below. She was taken up in a state of insensibility; began to vomit in twenty or thirty minutes, very soon became conscious, and from that time presented the following symptoms: She had some fever every afternoon; her cheeks were flushed. Light and noise distressed her greatly. The skin was dry and hot, and the tongue coated; there was an entire loss of appetite, accompanied with constipation. As the disease progressed she became delirious, and the action of the carotid arteries was greatly increased. Convulsions finally appeared, accompanied with paralysis of one side of the body. She was leeched; took the depressant mixture to control the fever. Blisters were applied behind the ears; alcohol and water to the head. Indeed, everything which I thought could benefit the patient was done, but only with a temporary effect. The post-mortem examination proved that the brain was softened, and the disorganized mass was mixed with blood and purulent matter. The membranes were lacerated, preternaturally vascular, and covered with plastic lymph. In such cases you should always be careful in your prognosis. Any physician who was not aware of the insidious character of such injuries, would have pronounced the child safe so soon as consciousness was restored. I told the parents that she was greatly in peril, and could not be regarded as safe until the expiration of five weeks. I would have pursued the same course in this that was adopted in the preceding case, if she had not been greatly debilitated, when the injury was received, by a severe attack of the measles. After any injury of this character, when the pulse becomes quick and full, the only remedy that will control the difficulty is the lancet; and if you intend to abstract blood, do not postpone the operation. Relieve the injured vessels; this will afford time by depressants to prevent any subsequent difficulty; if they are not sufficient to obviate the continuance of the inflammation, apply leeches behind the ears. They should be followed by blisters, and especial attention should be paid to the condition of the digestive organs. Calomel and the extract of juglans are the only remedies which rarely fail to act upon the liver.

I will now direct your attention to sanguineous effusions between

the cranium and scalp. This difficulty occurs at all ages, and is the result of violence. The tumor becomes sometimes quite large. They sometimes appear in children two or three days after delivery. In such cases never make an incision; watch and wait, and if suppuration takes place, which can be ascertained by the use of an exploring needle, make an incision. Insert a tent, and afterwards treat the case as an ordinary abscess. If you make an incision to evacuate the contents of such tumors, a troublesome hæmorrhage may follow. If, however, sufficient time is allowed for the mouths of the wounded vessels to close, and the escape of blood to cease, then if the contents, that is those that can be absorbed, do not disappear, an incision should be made and the same course pursued as when effusions of blood take place from injuries of any other character. Should the effusion be great, inflammation of the sac which contains the blood will take place, pus will form, and if not opened with a lancet or bistoury, will cause ulceration by pressure, and the contents of the abscess will be discharged. The discharge will continue until granulations fill the cavity and cicatrization is complete.

Compression of the brain results either from effusion, or depression of the cranium, and the effect depends upon the extent of the cause. The paralysis takes place on the opposite side from that receiving the injury, in consequence of the nerves crossing at the base of the brain. Effusion may be either primary or secondary; if the injury be sufficiently violent to open a large vessel, the blood escapes at once, and then you have the symptoms of sanguineous effusion. They are more or less insensibility, accompanied with paralysis of the opposite side of the body. Should a patient receive a blow and become suddenly paralyzed, it is positive evidence that there is pressure upon the brain, which must be produced either by extravasated blood or by fracture and depression of the bone. A great amount of pressure is not necessary to produce this effect. Many years ago, after removing a depressed portion of bone in a case of epilepsy, I pressed gently with my forefinger upon the dura mater, and the boy became insensible; but so soon as the pressure was removed consciousness returned, showing how slight a pressure was required to produce paralysis. Effusion may be either primary or secondary. Should a patient become insensible soon after the receipt of an injury, and remain in that condition, it is called primary. Should he be injured, and recover from the injury sufficiently to

walk and converse intelligently for an hour or two, and then become stupid, and the stupor gradually increase until he becomes insensible; in that case the effusion is secondary. In the secondary form of effusion the vessel wounded is probably not large, the blood escapes slowly into the cavity of the cranium, and the symptoms of the compression do not appear until a sufficient quantity has escaped to produce that effect. In such cases, where the extravasated blood is small in quantity, the effect is not alarming, as there is merely a numbness or slight feebleness, which may continue for a time, but so soon as the serum of the blood effused is absorbed, the brain is partially relieved, and becomes accustomed to the pressure, accommodates itself to the situation, and consequently very little inconvenience is experienced from the difficulty, yet I must say that whenever paralysis is produced by sanguineous effusion the consequences can never be entirely removed.

When the effusion is very great, and one side of the body is perfectly paralyzed, the patient will remain in that condition for two or three weeks; the speech may be partially restored, but recovery never ensues. Sometimes you will read, in a medical journal, of paralysis being cured by quinine and strychnine. The author of such articles I always regard as either a knave or fool, and am charitable enough to think that he is a fool.

Whenever you are called to a patient with paralysis of half of the body, if there does not exist a depression of the cranium, always say to the friends of the patient that the case is incurable. Tell them that he will gradually improve, but he never can recover. Then a consultation will either be called, or you will be discharged, either of which, unless your patient is very rich, should not be regretted. A gentleman of this city, forty-eight years old, who was wealthy, and intemperate in every respect, was returning one day from his office, when he had an attack of apoplexy. His right side was paralyzed, he lost the power of speech, and I told his wife he could never recover entirely, and if a consultation was desired I would meet the physicians he preferred. At ten o'clock A.M. we met. I had a dozen leeches applied behind the ears, followed by blisters, laxatives, and a proper diet, and as he had been an epicure, I directed the nurse to give him four or five glasses of old Bourbon in twenty-four hours. The physicians came, and said that they could not suggest anything better than what I had prescribed. The effu-

sion was not sufficient to destroy life, but only the sensibility and motion of one side of the body were impaired. This patient, who was rich, when he partially recovered the use of the lower extremity, and could with difficulty mount a horse, rode to the Cliff House often. Subsequently he rode in a sulky, without springs, to the Cliff and Ocean Houses and back, and enjoyed the ride. Being an epicure in every particular, very soon he had a second, third, and fourth attack, which ended in mental derangement. He was then sent to a private insane asylum in Alameda.

Both the mania and paralysis continued for two years, and the patient died both epileptic and paralyzed, in consequence of excessive eating, which will, even without the use of stimulants, produce consequences as serious as those caused by the excessive use of alcohol. Becoming disgusted with the physicians of this city, he went to New York, Baltimore, Boston, Philadelphia, and Albany. He received neither encouragement nor relief, and then he determined to go to Europe, and consult all celebrated men in London, Paris, Edinburgh, Vienna, and indeed all the celebrities of Europe. He returned, after an absence of a year, in the same condition as when he left, and probably not quite so well. He then discarded all the medical practitioners of the city, and employed every quack who exhibited a sign. He took tar-baths, sulphur-baths, and ultimately employed a Sandwich Islander to lomi-lomi him. As I predicted at the commencement of the difficulty, the disease proved to be incurable, and if he had taken my advice he would have suffered less, and would, when he returned, have been in better health than when he left.

There are men who cannot resist the fascinations of the genuine charlatan. Mystery is attractive, and now I advise you never to tell the patient what medicine he is taking. An old pioneer, and one who was popular when I arrived, always told his patients what medicines he administered, and after a time he lost his practice, because his patients had no confidence in the medicines he prescribed.

When a man in good health falls, and remains in a state of more or less insensibility, that condition is called apoplexy. I have already considered this difficulty, and will not recapitulate. When the skull is fractured and depressed, accompanied by paralysis, the portion of the cranium which presses upon the brain should be raised by making an opening near the depressed portion, and with an elevator prying

it up until it occupies its natural position; and then treat the case on general principles. When a depression of a portion of the cranium exists, but the patient retains his consciousness, there is no propriety in any operation, as it complicates the difficulty. I recollect several cases of this character which I treated with success. A child three or four years old was kicked by a mule; the calk of the hind shoe struck the centre of the forehead just above the root of the nose, fracturing the skull and lacerating the longitudinal sinus. I found it impossible to raise the depressed bone, in consequence of the profuse discharge of blood that followed the slightest disturbance of the depressed portion. The child had convulsions for four or five days, finally became conscious, and ultimately recovered; and when six or seven years old he was as bright as any other child of the same age. He is now living in Philadelphia, and well.

Tumors sometimes form on the brain, and produce the same symptoms. Such cases are incurable. In cases of tertiary syphilis, nodes frequently form on the inside of the cranium, and produce the same symptoms as those which result from effusion of blood, and these are the only cases that are curable. Give antisyphilitic remedies, generous diet, and in some cases stimulants, and after a few weeks the paralysis diminishes. I see almost every day a man who had primary, secondary, and tertiary symptoms, who was almost entirely paralyzed on one side, and complained of a want of sensibility on the other, who recovered entirely, and has been well for six or eight years.

The most common variety of tumor found in the brain is tuberculous. Very often tubercles form in the brain of young children; they suffer more or less until insensibility or convulsions occur, and then death soon follows. In such children hydrocephalus frequently appears, and as far as I have been able to ascertain, not a single positive cure has been effected. In such cases the head enlarges steadily, until it sometimes becomes enormous. As I said before, this always proves fatal. The spinal cord is liable to both concussion and laceration. When concussion of the cord occurs, temporary paralysis exists below the seat of the injury; but when there is a laceration of the cord, paralysis occurs, and that is always permanent. Some years ago, the son of the captain of a clipper ship from Boston, fell from the mainyard to the deck, and unfortunately struck upon a rope as thick as a man's arm; the spine was fractured, and the

lower extremities completely paralyzed. He had retention of urine, and, of course, constipation. I taught the father how to use the catheter; I directed him to procure an air-bed, and in two or three weeks he left this port for Boston; his son arrived there without bed-sores, and three years after the accident occurred the father returned, and called upon me to say that his son was in the Marine Hospital of Boston, was in good health, but could not use his lower extremities. In this case the bone was fractured, and the spinal cord lacerated.

Concussion of the spinal cord may be followed by inflammation. I have already told you how to control inflammation, and I now do not consider a recapitulation necessary. Concussion of the spinal cord may produce only temporary inconvenience, or may be followed by inflammation, which must be combated by the proper remedies.

Before closing this lecture, I will consider the disease called spina bifida. A deficiency of bone exists, and there being but slight resistance made by the cutaneous covering, the serum accumulates where the least resistance is offered. A tumor forms where the bone is deficient, and soon enlarges so much that the skin inflames, and when it ulcerates, inflammation of the spinal cord extends to the brain, and very soon proves fatal. Dr. Brainard, of Chicago, recommended that the fluid should be removed by the use of the trocar and canula, and equal parts of tinct. iodine and water should be injected and allowed to remain five minutes, and then permitted to escape. I adopted this method in one case in Green Street. The tumor disappeared, but the child never recovered the use of the lower extremities, and died in a few months from cholera infantum. I now have a case of spina bifida, and when the operation is performed will notify the class.

When a nerve is divided, or when strong pressure is made, as by tumors near the ear, paralysis of one side of the face occurs, in consequence of the facial nerve being thereby rendered insensible. When a nerve has been divided, if the extremities are placed in contact they will unite, and the function of the nerve be restored. Paralysis of the face is generally preceded by pain in the vicinity of the ear. It disfigures the face, and you should not expect immediate relief. Apply half a dozen leeches, which should be followed by croton oil or blisters, to be continued until the difficulty disappears. The general treatment should of course depend upon the condition of the patient.

When a nerve is wounded, it should be divided above the seat of the injury, and at least half an inch removed, in order to prevent the union of the extremities and the return of the symptoms. I treated, when I was very young, a negro boy, who had, some weeks before, his ulnar nerve wounded by the saws of a cotton gin. The power of the hand was destroyed; it was cold. He had difficulty in deglutition, and the power of speech was lost. At first I applied the actual cautery, as recommended by Jobert, of Paris. The symptoms disappeared, and he seemed to be perfectly well for two or three months, when the symptoms returned, and then I concluded to remove a portion of the ulnar nerve. The operation was performed above the wrist; half an inch of the nerve was removed; the wound healed rapidly, the symptoms of chronic tetanus disappeared, and in two months he was as well as any man in the State.

Occasionally a nerve is wounded, either by a nail, a fall, or a gunshot wound. When produced by the former, enlarge the opening, fill the wound with cotton or lint saturated with ol. terebinthinæ; let it remain for three or four days, and then the ulcer should be treated as any other of a simple character. Tetanus may result from the most simple wound, and when it does occur, if it be possible, the nerve should be divided between the seat of the injury and the brain. If this is impossible, you must rely upon the local application of sulph. morphia, and the use of the tinct. of cannabis indica internally, twenty drops every two hours, until the symptoms disappear. Tumors or enlargements of the nerves were considered when lecturing on tumors, and will not be referred to again.

LECTURE XXXVI.

GENTLEMEN: To-day I will lecture on the diseases of the mamma or breast.

Each of these organs is composed of twelve glandular bodies, which are intended to secrete milk, for a special purpose. They are so liable to disease, and their diseases are so numerous, that for convenience they should be classified. 1st. I will mention the derangement of the nutritive and sensitive action, which causes pain and enlargement; the 2d, includes those in which there is a collection of purulent matter. 3d. The third includes morbid growths, which are limited to the part in which they originate. 4th. Includes tumors of a malignant character, which have a tendency to spread, fungate, ulcerate, and derange the constitution.

I beg leave now to direct your attention to excoriations and ulcerations of the nipple. You will find in practice that they are more troublesome than any other simple disease with which you will have to contend. If proper precautions are not taken before delivery, and often under any circumstances, the nipple inflames, the mucous membrane is either detached or ulcerated, and every time the child attempts to nurse, excessive pain is produced. Sometimes in cases of ulceration, I have seen, in despite of treatment, the ulceration extend until the entire nipple was destroyed. Almost every nurse and physician you meet has a different remedy; and I have always found that when a great many remedies are recommended for the same disease, you may be assured that none of them have the desired effect. I have been troubled more by this disease than by any other I have ever treated. Some use the mucilage from quince-seeds. Some use glycerin and gum arabic. I have sometimes used glycerin and alum, five or ten grains of the latter to the ℥j. It soothes and at the same time hardens the mucous membrane, diminishes the irritability, and lessens the pain.

The most effectual remedy, when fissures or ulcerations exist, is to apply the nitrate of silver in substance; wash it off in a few minutes,

then apply simple cerate or glycerin; some prefer the sulphate of copper, but from experience I am satisfied that the escharotic before named is far superior, and relieves pain more speedily and effectually. Some nurses use Russian salve, and I must confess that in some bad cases the effect has far surpassed my expectations, and it does not injure the child. When the patient is unwilling to have the caustic applied, I prescribe the tinct. of catechu. It is a good application, and the nipples should be wet so soon as the child has nursed. A child should not be nursed oftener than every three hours, and should not be allowed to take the same breast twice in succession. The professor of obstetrics, during his lectures on this subject, will give you more information than it is possible that I could possess.

The derangements of nutrition and sensation include the indurations that occur at the age of puberty, and during the first months of pregnancy. Very often you will find that young girls, when there is some derangement, either an excess or diminution of the menstrual discharge, suffer from this difficulty; but the pain does not disappear when the discharge ceases. Dysmenorrhœa often exists in bad cases. In this disease excessive pain occurs, and sometimes continues for twenty-four hours before the discharge appears. You cannot expect to remove the effect without the cause. In ordinary cases of dysmenorrhœa, tonics, either vegetable or mineral, according to the condition of the patient, may be administered with great advantage. I find that the tonic mixture, composed of senna, nux vomica, aconite, and hydrocyanic acid, is generally better than any other I have prescribed. There are, however, other combinations of remedies which I prescribe in anæmic cases. They are pale, suffer greatly by ascending a flight of stairs, have no appetite, and the feet frequently swell.

℞. Ferri pulv., ʒiss.; gum aloes Soc., ext. stram., āā gr. xv. Misce. Fiant pil. No. xxx. Sig. Take one three times a day. As a soothing application to the breasts, you will find nothing better than the extract of belladonna. Take of the extract of belladonna, ʒij; adipis simplicis, ℥j. Misce. Sig. Spread upon chamois leather, cut a hole for the nipple, and wear it constantly. It is harmless, and from the result of experience in such cases, I am satisfied that it is the best application that can be made. Often during the first months of pregnancy the breasts become painful, they swell, and occasionally suppurate. I have treated many cases of this character, and the difficulty depends upon the organs engaged in the

same function. When fluctuation is distinct, open the abscess and treat it as I directed when lecturing on ordinary abscess. Before the abscess forms, and when suppuration is threatened, apply four or five double of flannel, wet with hot vinegar, which should be covered with oiled silk; apply morning and evening, and continue until the swelling either disappears or a collection of matter is detected. Then the abscess should be opened.

The second variety of disease of the breast includes cases in which there is a collection of pus. It embraces milk abscess and chronic abscess. After confinement, whether a woman aborts or has a child at the ordinary time, on the third day what is called the milk fever usually appears. The breasts swell, the secretion of milk takes place, and if the case is properly treated an abscess seldom forms. I have employed three nurses in this city, and an abscess never formed in any case treated by them. When an abscess forms, open it with a lancet or bistoury; insert a tent; apply mutton-suet or simple cerate. Milk fever never lasts more than twenty-four hours. After a confinement in which the pain continues longer than the time specified, you should suspect puerperal peritonitis, and employ the remedies recommended by the professor of obstetrics. In such cases opium is the sheet-anchor of success. Sometimes the child will not nurse, and the milk must be removed from the breast with a pump manufactured for that purpose. If a nurse can draw the breasts, or if a child or children in the neighborhood can be obtained, they should be preferred to a pump. Should the patient be able to find some young puppies, if their feet be covered with cloth, so that they cannot scratch, I think they are better than breast-pumps, or even nursing children or women. When the breasts are greatly enlarged, and indurated or tense, the nipple being either short or retracted, great danger exists of the formation of an abscess. If you have a good nurse there is but little danger; they generally use camphorated oil, and rub the breast with the hands from the nipple backward until milk is secreted. The friction with camphorated oil removes the accumulation of the blood, and when the quantity is reduced to the secreting point, the formation of milk takes place. A first-class nurse should be able to draw the breasts herself, or to adopt the means already recommended for that purpose. Should the quantity of milk be excessive, and the nipples sore, have a belladonna plaster made of ʒij of the extract, and hog's lard, ℥j; spread this upon chamois

leather, with a hole for the nipple, and apply it to the entire breast. Should an abscess form, the sooner you open it the better. Sometimes matter forms between the skin and mammary glands; the subcutaneous cellular tissue is destroyed, and an immense accumulation of pus takes place without presenting the appearance of an ordinary abscess. Should doubt be entertained as to the character of the difficulty, use the exploring needle, and then make a free incision; introduce a tent to prevent union by the first intention, and then use the warm-water dressing until the opening is fully established. With ordinary abscesses of the breast you are all familiar; before suppuration takes place they are solid, after that occurs, and the skin becomes red, they should be opened and treated as already indicated; or, if very painful, an incision should be made so soon as fluctuation is distinct. We often find in cases of this character, in which the nipples are sore, an indurated point not far from the nipple, which suppurates, and when opened soon disappears. Such an abscess is superficial, and consequently only a source of inconvenience.

This division includes simple vascular sarcoma, fibrous and cystic tumors. They do not spread beyond the part in which they originate. The mammary glands may become enormously enlarged, or in other words hypertrophied. There is not only a hypertrophy of the subcutaneous cellular tissue, but also an immense enlargement of the glands. I recollect an old lady, the most celebrated midwife in the country, who had that difficulty. I was a schoolboy, and boarding at a house to which she was called professionally. Her breasts were so long when not bandaged that they rested upon her thighs, yet she was active, and did not suffer pain nor much inconvenience from the enlargement. In this locality you will sometimes find a simple encysted tumor, which becomes inconvenient by its size and weight, and should be removed. Such growths are always simple, and consequently never return. Sometimes fibrous tumors form in the breast; they may be known by their firmness and smoothness, as well as by the slowness of their development. They should be excised. When such tumors are removed early and carefully, they rarely return.

I am sorry that I cannot say as much for the fourth variety, which includes carcinomatous and medullary, or cerebriform tumors. They are almost always fatal, yet a surgeon is sometimes forced to operate

during the early stages of the disease; but when the surrounding parts are implicated, I hope you will pursue the course which I have long since adopted. Remove a scirrhus, if the patient consents, before the axillary ganglions become implicated, but after the surrounding parts become involved, prescribe a belladonna plaster and some tonic medicine. She will not return, but apply to some young man who, to obtain notoriety, will remove any tumor that may be presented. In a few weeks the tumor returns, another is employed, and the former abused, and if a bill is presented after the disease returns, the friends not only refuse to pay the bill, but accuse the surgeon of killing the patient, in which they are often encouraged by the second physician called. Should he operate a second time in two or three months, the disease will return, and in a few days, when the physician visits his patient, he will find Li Po Tai by the bedside, and the patient is happy; but that condition does not long continue. Purgation and starvation in a cachectic condition of the system are not conducive to longevity, and very soon you will be required to sign the certificate. I generally send the applicant to the city physician. The description, history, and development of these tumors were given in my lectures on tumors delivered some months since, and it is unnecessary now to detain you longer on this subject; I however beg leave to say that whenever you decide to remove a tumor of this character, be careful to remove the entire breast, except a sufficiency of the skin to cover the wound, and that should be healthy. I have had a case recently which sustains the view I take of this course of treatment. A lady from Visalia applied to me with a small, hard tumor, near the nipple, which, from her age, I thought was not malignant. The operation was confined strictly to the tumor. She went from San Francisco to Humboldt County, and returned to San Francisco at the expiration of a year with a tumor ten times as large as the one removed. I then removed the entire breast, the wound healed readily, and she left the city for Sacramento. She returned to this city recently, a year having elapsed from the time the operation was performed, perfectly well. After a careful examination I could not detect the slightest evidence of a return of the disease, and she may wholly escape it. Sometimes, after a malignant tumor has been removed from the breast, it does not return in the part in which it was located, but forms either in the lungs, the pleura costalis or pulmonalis, and finally proves fatal. The patient coughs a great

deal, expectorates freely, and as the difficulty of breathing increases, she begins to emaciate, and is soon exhausted by the expectoration, night-sweats, and especially by the loss of appetite and digestion. Thirty years ago a lady from an interior small town visited Columbia, South Carolina, with what I thought was encephaloid. A fungous tumor projected above the skin, as large as a man's fist, from the external surface of the right breast. She told me that she came to have it removed, and desired to return as she had come, in her own carriage, in three days. Her general health seemed to be perfectly good, and the morning after her arrival the tumor was removed. The wound was closed so as to heal by the first intention, and in three days the mother of Governor Gist, of South Carolina, left Columbia, reached home safely, and when Dr. Bobs, who is now in Marysville, came to California, he told me that Mrs. Gist was alive and well with the exception that she had an epithelioma upon the nose, which was not alarming by its progress. I have mentioned these cases so as to encourage you to remove a tumor a second time, when the adjacent parts are not implicated, and the cancerous cachexia has not appeared. Many talented and worthy young men take desperate cases; but no matter how anxious a physician may feel to operate, he should select a case in which a strong probability of success exists, and then he will not be often disappointed. When a breast is removed, even under favorable circumstances, and the disease returns, the parties interested will always be dissatisfied, and should a second operation be required, they will employ some other surgeon to perform it, unless the friends are sufficiently intelligent to resist such interference.

I recollect that about ten years ago a young lady came from Petaluma with an encephaloid of one of her breasts. I removed it. She returned home, and in three or four months she came to the city with a tumor much larger than the original. In the first operation I removed the axillary ganglions. The axillary artery was exposed for several inches, and I dissected the diseased mass from the coats of the artery. The disease returned, and a few months ago she employed a Frenchman of this city to perform a second operation, which proved fatal, probably from hæmorrhage. In my operations I like to have three or four young men around with artery forceps, and then I am fearless.

LECTURE XXXVII.

GENTLEMEN: Before I endeavor to describe the various diseases of the uterus, I beg leave to say a few words in reference to the speculum, which is the instrument used for the purpose of examining the vagina and uterus. The best form of the instrument is a bivalve, with one blade longer than the other. I have, for eight or ten years, occasionally used one of large size, when the uterus could not be exposed by the ordinary glass instrument. When this bivalve speculum is introduced, the long blade should be turned posteriorly so as to receive the uterus when the blades are separated. This instrument fulfils every indication. In some cases an ordinary small bivalve speculum is more convenient, and particularly for examining the vagina and urethra. Many prefer a cylindrical glass speculum. This is cheap, exposes the os uteri exceedingly well, and is not stained by the use of the nitrate of silver. I always keep four or five of them in my office of different sizes, for sometimes the organs are so irritable that a very small speculum becomes necessary. At my office I use a Chinese chair, place the patient upon the back, and use soap for the purpose of lubricating the instrument, so as to lessen the pain. When I treat ladies at home, they generally cover themselves with a sheet, in the centre of which there is a small opening, through which the speculum can be passed conveniently. It is necessary to have a good light, and either a lounge, sofa, or bed may be used. When the preparations are neither tedious nor extensive, the patient submits with less reluctance to an examination. You should become familiar with the use of the female catheter. I have frequently met physicians in consultation who could not pass a catheter without exposing the patient. But if you take the forefinger of the left hand, and pass it below the clitoris, it will come in contact with a projection which is the female urethra. The catheter should be guided by the finger to that point, and it will readily pass into the bladder. The female urethra is not much more than an inch in length, and unless a stricture exists, the catheter will pass without any difficulty. When the female urethra

is strictured, I generally have a conical bougie straightened, and passed into the bladder, and allowed to remain half an hour; the operation should be repeated every alternate day until the stricture is cured. In a remarkable case of stricture of the urethra, in this city, in which the bladder was enormously distended by constant and continued pressure, I passed an ordinary female catheter into the bladder; the operation was repeated several times, when the patient resumed her former course of dissipation, and the same difficulty returned. Some physicians were called to see her; they decided to puncture the bladder, and she died of peritonitis, a few days after the operation, from the infiltration of urine. It is always safer to force the catheter or bougie through the urethra than to puncture the bladder, which, with me, has always been regarded as the last resort, and an operation that I never have performed but once, and with a satisfactory result.

The external organs of the female are liable to various diseases, such as hypertrophy, cysts, and varicose enlargement of the veins. Very frequently you will find a patient with enlargement and induration of the labia, preceded by inflammation, which is often produced by excessive indulgence. When fluctuation becomes evident, the abscess should be opened; should it return, the sac should be removed, and then the difficulty will be finally overcome. I have treated many cases of this character, and one case in which an abscess occurred at every monthly period, which I cured by removing the sac. There is another difficulty which frequently exists, and that is an enlargement of the veins of the labia, which sometimes becomes so great as to absolutely prevent coition. This enlargement sometimes involves not only the vagina, but also the vulva. Sometimes the veins become so enlarged that they yield to the distension, and nothing but pressure will arrest the hæmorrhage. The female organs of generation, particularly when there is a discharge of mucus from the vagina, are affected by warty excrescences of the vulva. Each wart should be tied with a separate ligature, if possible, and when they drop off they will never return. Warts that are not of a specific character almost always result from inattention to cleanliness. If they do not disappear after the application of Monsel's salt, and are too numerous to ligate, these should be removed with scissors, and the Monsel's salt applied every day until the parts heal entirely. Nævus, which I have already described, sometimes appears in the

labia. This difficulty is serious in proportion to the size of the tumors; when small they may be excised, when large a ligature should be applied subcutaneously, as described. When lecturing upon this subject I said, Never tie the skin, because tetanus frequently results from so doing. After the separation of the ligature, then the discolored and diseased skin should be removed.

In cystic tumors of the labia, the cyst usually contains a sanguineous or turbid fluid, but sometimes you will find a wen, all the varieties of which do not contain the same substance, but require the same treatment. They should be removed, and you must remember that hæmorrhage is generally more profuse after operations upon the labia, than upon any other portion of the body. Tie every vessel that bleeds. The wound should not be closed until the bleeding has entirely ceased, and then if not near the residence of the patient, apply, or at least prepare, a bandage with compresses, and leave directions how they should be applied, with a compress. A bandage properly applied will arrest any hæmorrhage that may result from such an operation. Even in uterine hæmorrhage, the tampon and a compress, secured by a T-bandage, will arrest any hæmorrhage. Should that fail, in consequence of not being properly applied, remove the sutures, open the wound, apply wet lint covered with Monsel's salt. Dry lint should be placed over that, and secured by the T-bandage. Sometimes after marriage the hymen exists and is so strong that sexual intercourse cannot take place. In such cases give chloroform, introduce the forefinger, and rupture the hymen; but little force is necessary. We are called upon to perform this operation very seldom, because nearly every mother who discovers the existence of this membrane goes to the most popular physician in the vicinity to have it destroyed. They cannot be convinced that it is natural, and demand an operation. In such cases I pass an ordinary steel director through the small opening, at the upper edge of the membrane, when in a recumbent position, and with that lacerate the hymen. Then when the mother is convinced that the obstruction is removed she is perfectly happy, and will pay more liberally than for any other slight operation that I am required to perform. I operate in such cases for the relief of the mother. If I refused to do what she thought should be done, she would employ a charlatan, who would charge two or three hundred dollars, and probably inflict a permanent injury upon the child. It is by all na-

tions regarded as a positive evidence of virginity, even among savages, and with educated people I can very soon convince them of the necessity of having the hymen intact, because it seldom presents any serious obstacle to coition. Strumous children have, with ophthalmia, a discharge from the vagina, which from the irritation and the itching necessarily resulting, may induce the destructive habit of masturbation. To-day I saw a child two years and a half old, whose hands were tied for the purpose of stopping that indulgence. I cut the gums covering the jaw teeth, gave the child sulphate of quinine, with fluid ext. of senna, and ordered ʒiv of alum to be put into a quart of water, and used twice a day with a syringe. A few days since, an ignorant woman came to my office with three female children; they all had a discharge from the vagina; one of the girls was three years old, the second one year and a half, and the third had attained the age of six months. She accused a lodger in the house of having communicated gonorrhœa to these children. I told her the idea was ridiculous, that she or her husband was scrofulous, and that it was necessary that they should take medicine to strengthen them, and use an alum wash.

I have treated a very extraordinary case in this city. My patient began to menstruate at the age of twelve years, and at twenty-two she had a long spell of sickness; when she recovered, the menstrual flow disappeared entirely. After suffering excessively for several days, a slight discharge of blood would escape from the rectum, and the womb experienced relief. The vagina was completely closed, and I operated in the presence of four of our best physicians, reached the uterus without wounding either the rectum or bladder, kept the passage from closing by the introduction of oiled lint, and when the next menstrual period arrived, she did not experience any pain. Very soon she became pregnant, and I delivered her of a dead child with forceps, after having divided with the scissors the bands that had formed in the vagina and produced the difficulty. Subsequently I delivered her of three living children. This case was published at the time in the *Pacific Medical Journal.* I made the incision transversely between the urethra, bladder, and rectum. After cutting about three inches, a flow of blood occurred. It was coagulated and black, as blood would be that had been excluded from the air. After the operation, a roll of lint about the size of the vagina was introduced, and inserted as often as it escaped. This patient has

entirely recovered, and has a large family. Sometimes the hymen completely closes the vagina, and when the passage becomes distended the pain is excessive, until the hymen is divided either with a lancet or bistoury.

Occasionally there is an entire absence of the vagina and uterus, and probably of the ovaries, although the subject may be otherwise well developed. I examined, some years ago, a lady, a stranger in this city, who was to all appearance physically perfect. She had never menstruated; the vagina was defective, the opening only extending beyond the urethra. With another physician, a careful examination was made, and we decided that she had neither vagina nor uterus. The lady was not satisfied when I refused to perform an operation for the purpose of affording relief, and went to New York, for the purpose of consulting Dr. Mott. He cut where the vagina should have been, until the peritoneum was exposed, and then very wisely declined to make the incision deeper. A year elapsed before the wound healed. After this unsuccessful attempt she was satisfied that my opinion was correct. Even her sisters were not aware of the existence of any difficulty.

Sometimes the clitoris is hypertrophied, probably as the result of masturbation. In such cases it should be reduced to its natural size with either the scissors or a scalpel, or it may be removed, as Erichsen recommends, by either a single or double ligature, and then no trouble should be apprehended. Tumors occasionally form in the vagina; they may be mucous polypi, cystic tumors, or vascular sarcomata. When of a mucous character, remove them with the scissors or forceps; when vascular, apply a ligature; when they are located over the urethra, great care should be taken not to include any portion of the canal. A large gum-elastic bougie may be inserted, and in a case upon which I operated recently, I passed my finger and thumb below the catheter, and Professor O'Neil applied the ligature sufficiently tight to effectually strangulate the tumor. In a few hours a profuse discharge of blood took place from the uterus, and could only be arrested by the tampon and T-bandage. The former was removed on the third day, the tumor came away on the sixth, and the patient left the city on the twelfth day. The most remarkable case of cystic tumor that I have ever seen I operated upon in 1866, assisted by my nephew, Dr. William Belton, of Colusa County, California. A servant girl, about twenty-five years

old, applied to me for assistance. I found the uterus with the entire vagina hanging between her thighs. The appearance of the mucous membrane was entirely changed, and resembled the skin more than the mucous membrane. She said that she had been in that condition about seven years, and for a long time did not know, or pretended that she did not know, that it was anything either unnatural or dangerous. The vagina and uterus could be returned, but on the right side I could detect fluctuation. I went prepared to remove an inch from each side, and when the edges were approximated and held in that position, the vagina would be so much contracted that the uterus could be retained in its natural position by a pessary until it would no longer have a tendency to protrude. Being satisfied by the distinct fluctuation that a cyst existed, which forced the uterus and vagina from the pelvis, I made an incision, and a pint of a glairy yellowish fluid escaped; the uterus was then pressed upward, the walls of the vagina were raised with common forceps, and then the toothed spring forceps were applied, so as to include an inch in width and three inches in length, extending to the inferior part of the vagina. Silver sutures were inserted, and the portion of the vagina included in the grasp of the forceps was removed by strong curved scissors. The forceps were then applied to the left side, and the same operation performed. The ligatures were removed in eight or ten days, when the wounds had healed. A stem pessary was introduced, which she had worn two years, when she came to my office to consult me in reference to the propriety of forming a matrimonial alliance. I told her to get married, and that she should wear the pessary during the day, and if she needed advice or if she should become pregnant, I wanted her to see me at my office. She married, but for the last two years I have not seen her.

Sometimes the vagina protrudes so as to give considerable inconvenience, and when the patient becomes weary of the constant annoyance, a double ligature should be applied to the tumor, with sufficient force to destroy the vitality of the part included, and after the ligature is detached the wound heals very rapidly. When a prolapsus of the vagina is accompanied with a protrusion, either of the bladder or rectum, great care is necessary to prevent these parts from being included. Should the posterior portion of the vagina protrude, then the finger should be introduced into the rectum, in

order to ascertain whether it contributes to the enlargement, and if the tumor appears anteriorly, the female catheter should be used, so that the bladder may not be implicated. The vagina often becomes inflamed, both by specific and natural causes. The former difficulty I have considered.

The leucorrhœal discharge resembles the gonorrhœal so nearly that it is impossible to decide positively without an expensive examination. Generally I am guided by the appearance of the patient and the circumstances of the case. Both children and women of a strumous diathesis have leucorrhœa. Sometimes every female in a family is thus affected. Children, so soon as they begin to get their teeth, may have this difficulty; sometimes it is complicated with inflammation of the eyes, discharge from the ears, and eczema of the scalp. In such cases give tonics and astringent injections, and if that local treatment does not afford relief, introduce a glass pessary, and cauterize the entire mucous membrane of the vagina three times a week; by this method I have never failed to effect a permanent cure, when combined with the tonic mixture which I have already given, and a solution of sulph. of zinc after the character of the disease has been changed. I generally recommend from ʒiss to ʒij of sulphate of zinc to be put into a quart of water, and used with a female syringe morning and evening, whilst in a recumbent position. It should be retained at least five minutes, and continued for ten or fifteen days after the discharge ceases. This difficulty is almost always accompanied with pains in the back and thighs, with soreness across the lower part of the abdomen. When the mucous membrane covering the os uteri and lining the entrance into the uterus becomes inflamed, the patient should be examined, and if there remains attached to the mouth of the uterus a considerable quantity of clear mucus, you will almost always find a diseased condition of the mucous membrane lining the entrance to the uterus. Always give tonics and laxatives, and introduce a strip of lint half an inch wide, covered with Monsel's salt, as far as the inner os, leave it in that position for two or three days, and if the secretion of mucus has not been arrested, the operation should be repeated. I formerly applied caustic, but I now know there is no comparison between these remedies. In cases of menorrhagia which have existed for months, two applications are generally sufficient to arrest the disease. The blood passes from the inside of the neck of the womb, and by adopting this treatment and

the ferruginous preparations afterwards, the patient will very soon be restored to perfect health. When a woman suffers from protracted uterine hæmorrhage, always make an examination with the speculum, and if no ulceration or polypous tumor exists, introduce lint with the precautions already given. Ulcerations of the uterus are generally accompanied with a purulent discharge from the vagina, with pain in the back and in the lower part of the abdomen, which frequently extends to the thighs, and is often the cause of hysteria. Whenever a female, if married, complains of a choking sensation, which sometimes continues constantly, or may recur at intervals, always examine the uterus with a speculum, and if inflamed or ulcerated cauterize the mucous membrane or the ulcer with nitrate of silver every alternate day. Give tonics and laxatives, and very soon the hysterical symptoms will disappear. I returned from Europe in November, 1834, and very soon had all the young and old hysterical women under my care. I found by the use of the speculum that in every case there was either inflammation or ulceration of the mucous membrane of the os uteri. I treated them both constitutionally and locally, and in ninety-nine cases in a hundred they were soon restored to health. A few years ago a woman came from Placerville; she was hysterical, had dyspepsia, and I told her that I could not give an opinion without making a speculum examination. I found the womb ulcerated, and told her that travelling would not do any good under such circumstances, and that she should return to her Eastern home. I examined her uterus, and found the os ulcerated. I made the necessary applications, and in a few weeks the ulcers healed, and she was restored to perfect health. In ulceration of the uterus, nitrate of silver should be applied every alternate day, and such tonics and laxatives administered as may be found necessary. I have observed that patients suffering from irritation or ulceration of the womb are almost always constipated, and to obviate that and improve the general health, which is generally greatly impaired, I give my favorite tonic, as already directed. A simple excoriation of the neck of the uterus may exist; in all such cases apply the nitrate of silver a few times, then recommend a solution of Monsel's salt, sulphate of zinc, or alum, and of course prescribe such constitutional treatment as the case may require. In ulceration of the womb Velpeau recommended the acid nitrate of mercury to be applied every day for eight or ten days, and then discontinued for two weeks. Should the ulcer

fail to heal then, the treatment should be resumed. I prefer Professor Gross's method, which I have already given. Sometimes females with red hair and fair skin, which are always accompanied with irritable mucous membranes, suffer excessively after the application of the nitrate of silver. In such cases the caustic should not be reapplied until the pain subsides by means of injections of tepid water and the use of narcotics. After the ulcers heal, should the neck of the uterus remain enlarged and indurated, which often occurs, I generally prescribe an alterative composed of iodide of potash and corrosive sublimate in proper doses, and puncture the os uteri with a small bistoury or lancet, attached either to a pencil or a common redwood stick; numerous punctures can be made without much pain, and after being repeated several times, equal parts of tinct. iodine and arnica should be applied with a camel's-hair pencil every alternate day, until the difficulty is removed or you are satisfied that the case is incurable, and then the only hope that remains is that the difficulty may disappear when the age arrives for the cessation of the menses. Displacements of the uterus are very common, but I am satisfied that they do not produce the constitutional and local symptoms generally attributed to this difficulty. I am acquainted with four very small women who are suffering from prolapsus of the uterus, and they experience neither local nor constitutional disturbance. It is very important for you to recollect that there are between two and three hundred pessaries now in use, and the number should be attributed to their inefficacy. I have never used but one pessary in my long practice that gave me satisfaction, and that was Vane's stem pessary. It has been modified, but not improved. I removed from the vagina of an Irish girl a few days since a gum-elastic pessary, which she had worn more than ten years, as the physician who attended her died in this city in 1866. The pessary when removed was rotten, and so offensive that I was compelled to destroy it before my office hour.

On the inside of the neck of the uterus you will occasionally find polypoid tumors. They may be either mucous or fibrous. The character is easily determined. The mucous polypus is transparent, always soft, and can be removed with polypus forceps without the slightest trouble. After they have been removed, lint wet and covered with Monsel's salt is applied to the wound, and the hæmorrhage thus arrested immediately. Suppose you meet with a fibrous

polypus, cases of which I have often treated, a digital examination is necessary. I think I may say that such tumors generally form in the uterus, and when they arrive at a certain size the uterus contracts, and the fibrous tumor is expelled, and then can be removed with polypus forceps or the écraseur armed with iron wire. I would advise you to administer chloroform, apply the forceps to the tumor, and twist it off, and if any difficulty arises, the Monsel's salt can be applied so as to control the hæmorrhage. Some years since a celebrated actress visited this city and sent for me to arrest a uterine hæmorrhage, which her physicians could not control. She was treated for prolapsus of the uterus. By a careful examination I found the vagina filled with a fibrous tumor. Dr. Cameron, my nephew, assisted me; and after the tumor was twisted off, lint, covered with Monsel's salt, was applied, and the patient recovered so rapidly that in ten or fifteen days she left the city perfectly well. Several more cases of this character have been treated by me during the last four years, and in some cases I used the écraseur with a strong iron wire; but in consequence of the wire being liable to break, I have decided always to use either the forceps or the ligature.

To determine the existence of a cancer, the uterus should be examined by the touch, and its true condition ascertained. In the treatment of cancer you can palliate, but you cannot cure after ulceration takes place; give opium, hydrate of chloral, and indeed anything that will relieve pain. Locally as a disinfectant, I prefer the chlorate of potassa; a saturated solution should be used four or five times a day, by which the comfort of the patient may be greatly increased. There are other forms of malignant disease which do not require especial treatment. I will not detain you by describing them, as they were noticed particularly in my lectures on tumors. When I was in Paris, Lisfranc removed the uterus. The disease returned, and the patient died. The uterus should not be removed unless it has, with at least a portion of the vagina, presented externally, and then if the bladder is not implicated, a double ligature should be applied, and the protruding part removed. Some years since, Professor Geddings, of Charleston, published a successful case of this character.

LECTURE XXXVIII.

GENTLEMEN: To-day I will say something to you about ovarian tumors, a subject which has very greatly increased in importance within the last twenty years. When I was a student, much excitement was produced in the entire community by the first successful operation for the removal of an ovarian tumor, which was performed by Dr. McDowell, of Kentucky. He passed his life in Kentucky, and did not profit, except in reputation, by that great achievement. Great men are often modest, and I am certain that surrounded by his friends, and secure in the respect of his neighbors, he was much happier than he would have been had he gone to a large city.

Ovarian tumors may be fibrous, cysto-sarcomatous, or cystic. The latter are either unilocular or multilocular. Unilocular tumors consist of a cyst filled with serum. The multilocular are composed generally of various cysts, and in some cases no two are filled with the same materials. In some of the cysts, in a case upon which I operated in 1836, I found a fluid that resembled honey; in the adjoining cyst were found balls about the size of a marble, enveloped with hair ten or fifteen inches in length, and perfectly straight. The patient being black, this seemed to be something very extraordinary. An adjoining cyst was filled with a turbid whitish fluid, in which bones of various sizes, and irregular in shape, were lying. The contents of the tumor being partially removed, the abdomen was closed, and the woman lived several days, dying of peritonitis. Why such tumors are developed, it is impossible to ascertain. An enlargement and displacement of a kidney, when it extends down to the pubis, may be mistaken for an ovarian tumor. I treated a case of this character many years since. The tumor filled the left side of the abdominal cavity, extending from the ribs to the pubis. I made a small incision, punctured the tumor, and not finding any fluid, I examined the part that presented, and was satisfied that what I had attempted to remove was a kidney. The wound was closed, and the patient died in ten or fifteen days; and a post-mortem being allowed,

the kidney was removed, and is now in the College Museum. This kidney weighed seventeen pounds and a half. No surgeon should be blamed for making such a mistake. The pedicle or elongated attachment was nine inches in length, and the inferior extremity of the tumor rested upon the left side of the pelvis.

Ovarian tumors always appear either on the right or left side of the uterus. They give rise to more or less inconvenience, and after they have acquired considerable size, the position can be easily changed, until the distension becomes sufficiently great to limit the motion. When the cyst is unilocular, fluctuation may be detected, and may lead to an error of diagnosis, which is always unpleasant. Such a mistake is often made. The fluctuation in unilocular ovarian cysts is not so distinct as in ascites, because the sac, as well as the abdominal parietes, intervenes between the fluid and the hand. When any doubt in reference to the character of the tumor exists, use an exploring needle. If fluid is found, perform the operation for dropsy, and after the cavity has been emptied, you can positively determine the condition of the abdominal organs. If an ovary or the ovaries are diseased, then should the effusion return, and the patient desire permanent relief, you can select the operation which you prefer, after you have become familiar with the methods recommended.

Fibrous enlargement of the ovaries, or the development of fibrous tumors in them, may occasionally occur. I exhibit one removed by myself, which as you see was about as large as a man's fist; it was movable, solid, and gave rise to some inconvenience. The woman came from Martinez, in this State, and was determined to have it removed. I was assisted by Dr. Russell and other physicians of this city. The tumor was removed through an incision about four inches in length, which extended from the anterior spinous process of the ilium downward and inward, and one inch above Poupart's ligament, to the inner extremity of the tumor. After exposing the tumor, the pedicle was secured by a strong double ligature, and the growth removed. The ligatures were retained externally; strong pins were passed through the edges of the wound and pedicle; the balance of the former was closed by the interrupted silver suture, and the warm-water dressing applied, and continued until the ligatures were detached, and then the edges of the skin were approximated, except the point occupied by a small tent, which afterwards

closed by granulation. Very little constitutional disturbance followed this operation, and she is now well. She has had three children since.

A cysto-sarcomatous tumor is much larger generally than a fibrous. I operated upon a case of that character three years ago; Dr. Lane, of this city, was present. The tumor was large, and the attachment so extensive that the sac was divided, the tumor removed, and a double ligature passed through the base of the sac; the remainder was removed. The ligature was placed in the most dependent portion of the incision, in order to allow the secretions to escape. She was very comfortable for two days; peritoneal inflammation then took place, and the patient died from that cause in four days after the operation.

In cases of unilocular cystic tumors, or in other words, ovarian dropsy, penetrate the tumor, and allow the canula to remain, in order to permit the fluid that may have formed to escape. The canula through which the serum escaped, being larger than the one I use to drain the chest, I think should be preferred.

In multilocular tumors, a large incision must be made, and the tumor removed; the pedicle should be secured either by a clamp or strong ligatures, and the case treated subsequently as already described. In simple cases of ovarian dropsy, a small incision should be made; the cyst should be opened and the contents allowed to escape, and then the empty sac should be drawn out, secured by a strong double ligature, which should be allowed to remain externally in order to obtain drainage. The operations for ovarian tumors, in San Francisco, have not been successful, compared with reported cases. Dr. Nelson, if living, is now a resident of New York city; he operated upon two cases, and they were both successful.

I have seen calculations made from the result of three hundred operations, in which the tumor was removed. Of the three hundred, one hundred and ninety survived, and if that is the average result, the operation in favorable cases is justifiable. Very often after making an incision, it is impossible to remove the tumor, and death is inevitable, particularly when the cyst is multilocular. I have operated in this city, or, in other words, have tried to operate, five times. In one case the tumor was not ovarian, but an enlarged kidney, as already mentioned. In another case a small incision was made, and fifty-eight pounds of serum escaped when the open-

ing was enlarged, so as to enable me to expose the ovaries. I found them both extensively diseased, and decided that their removal was impossible, but in both cases in which I removed the tumor the recovery was complete, and in one case the woman has had several children since.

I have not operated upon ovarian tumors as often as might be supposed from my extensive surgical practice. The reason is that I have never persuaded any person to submit to a surgical operation, except in cases of stone, aneurism, and strangulated hernia, diseases that must prove fatal unless speedily relieved. I never say to a patient, even if the operation is slight, that no danger need be apprehended, because sometimes death results from the slightest injury.

Ten years ago I treated an unmarried woman for peritonitis. She had an ovarian tumor. After she recovered I was requested to remove the tumor, but declined, because I knew that extensive adhesions existed, and that the operation would necessarily prove fatal. She then went to St. Mary's Hospital. One of the surgeons of that institution removed the tumor, cutting and tearing up the adhesions, and she lived about twenty-four hours in the most horrible torment which was ever experienced by any human being. Her cries interfered with my visit. Had she taken my advice she might have lived many years, and would not have suffered so much as she did the day she died. Out of three hundred cases operated upon, in eight no tumor was found. So that you must be exceedingly careful not to operate until you can positively decide that an ovarian tumor does exist, and if the patient desires its removal, you will operate. Recollect, in three hundred cases, in eight no tumor was found. The colon was probably impacted, and you should never think of performing this operation until you have administered ox-gall as a purgative, and the infusion of senna leaves ℥j to the pint of water, as an enema. A few weeks since I examined a lady who was supposed to have a tumor extending from the right hypogastric region to the left side. I ordered an enema of senna, one ounce to the pint of boiling water. After the intestines have been emptied by the injection, then you should give the antidyspeptic mixture, which I then not only described, but also presented every student with a copy. I have been astonished by the want of detail exhibited by all the English authors. They say to you, give quinine, give iron, without stating the object of the prescription. They are almost al-

ways defective in detail. Before performing an operation of this character, have the bowels thoroughly emptied, as I before stated. The room, if the weather be cold, should be heated artificially to the temperature of 75° or 80° Fahrenheit, and the condition of the bladder should be attended to especially, because when an incision is made from the umbilicus to the pelvis, should the bladder be distended, it might be wounded, which would be a very serious complication. The patient should be placed at the edge of a table, the feet resting upon two chairs. When the serum has been removed from a unilocular cyst, an incision three or four inches long should be made, which will be sufficient to enable you to remove the sac. Cases may occur, however, when the tumor is so large as to require the incision to extend the entire length of the linea alba. Should adhesions exist, they may be destroyed by the introduction of the hand, but before the hand is passed into the peritoneal cavity, it should be wet with a fluid composed of the white of an egg and water, rendered saline by the addition of a small quantity of common salt. The hand being covered with this artificial serum, does not produce so much irritation. The incision is easily made, but I am sorry to say that it is very difficult to prevent the escape of the intestines. One assistant should be placed upon each side of the patient, with his hands wet with the solution already mentioned, for the purpose of preventing the occurrence of that difficulty. The serous membrane is irritated by coming in contact with extraneous matter, and is liable to inflame. As the tumor is removed, the assistants should press firmly on each side so as to approximate the edges of the wound, and prevent the escape of the contents of the cavity. When the ligatures have been applied and the sac or tumor removed, some return both the stump and the ligature, and close the wound with the silver suture. When that course is pursued great success should not be expected. I am satisfied from my own cases, as well as by the success of others much more competent by having had more experience, that the most successful method is to draw the pedicle through the wound, secure it by a strong double ligature, and divide it about half an inch from the ligature. The incision should not be made too near to the ligature, for if that was not sufficiently tight, hæmorrhage might occur, which almost always proves fatal. The pedicle should be fastened to the edges of the wound by strong toilet-pins, the wounded surface being external, and the balance of

the wound should be closed by the interrupted silver suture. In other words, the pins should pass through the pedicle, and be made to include both edges of the wound, and then be secured by a figure-

Fig. 75.

of-8 ligature. For the pins the clamp presented (Fig. 75), may be substituted, which fulfils the same indication. If I were to operate to-morrow, I would secure the pedicle by a strong double silk ligature, close the wound firmly around it, and retain it in that position. Before the ligature is applied, you should divide or remove the peritoneum, so that it cannot be included in the ligature. After the operation the catheter should be used in four or five hours, or Sims's catheter should be introduced, with a gutta-percha tube attached, a yard in length, so that the urine can be conveyed into a receptacle, which will relieve the patient of great annoyance. The bowels should not be allowed to act for a week or ten days. The patient should take corn-meal gruel, chicken-water, beef tea, and indeed anything that is simple, and that can be almost entirely assimilated, so that very little fecal matter will remain. To quench thirst, give a solution of either gum-arabic water or barley-water, or when the stomach has not been irritable, lemonade may be allowed, weak and in moderate quantities. On the twelfth day, pour a pint of boiling water upon one ounce of senna, cover it until cool, and inject it into the rectum, by which you will with positive certainty cause the bowels to act. You should, however, expect pain when the indurated fecal matter passes that has been retained ten or twelve days. The most important part of the treatment after all surgical operations is to prevent pain. Before operating give a large wine-glassful of good whisky or brandy, which always lessens the risk

of the exhibition of chloroform, and as soon as the operation is completed give a quarter of a grain of sulph. morph., and repeat every hour until relief is obtained. I can say that I have been very successful. I saved every patient from whom the tumor was removed.

There is another difficulty to which I beg leave to direct your attention before I close this lecture, and that is, vesico-vaginal fistula. Thirty years ago this was a very common difficulty, and generally resulted from allowing the child's head to remain in the passage too long. I always waited until after the head ceased to advance four hours, and then applied the forceps, and I have never operated upon the wife of one of my patients for a difficulty of this character, and never would if I were to live a hundred years. The first successful operation was performed by my friend, Dr. Marion Sims, a native of Lancaster District, South Carolina. He graduated and located in Montgomery, Alabama, where he performed the first successful operation for vesico-vaginal fistula. The success of that operation, and bad health, caused him to leave a Southern State and locate in New York city. When it was ascertained that the operation was a success, the ladies of New York, headed by the mother of one of our distinguished citizens, raised funds sufficient to build a hospital, which is called the Women's Hospital of New York City, and is now under the care of Dr. Emmett, who has never disgraced his teacher. Vesico-vaginal fistula was regarded as incurable thirty or thirty-five years ago, and if a Sims had not appeared in the profession, it would probably still have been so considered. This lesion generally results from tedious labor. The pressure made upon the part that intervenes between the bones of the head and pelvis destroys the vitality so that it sloughs, and an opening is established between the bladder and vagina. I have delivered more than two thousand women, and such a thing never occurred in my practice, because I never allow a child, after the progress of the head has been arrested, to remain in that position more than four hours. Then I either use the forceps, or adopt other means. Should the opening be very small, you can frequently close it with the actual cautery. Before Sims's discovery I cured two cases in South Carolina by the use of a red-hot knitting needle, applied every week. When a cure cannot be effected in that way, the only alternative that remains is Sims's operation. The patient should be placed either upon the side or upon the knees, with four or five pillows under the body

and head, in order to render her comfortable. Then introduce Sims's duckbill speculum, which exposes the part more effectually than any other instrument. So soon as the instrument is introduced, the vagina is filled with air, and then no difficulty will be experienced in keeping the parts in view. It is useless to give the history of this operation, and consequently I will only describe the one approved of and practiced by Sims. The edges of the opening should be freely removed, and the silver sutures inserted a fourth of an inch apart, which may be done either with the small needle and holder in the Sims case. Simpson's instrument, which I exhibit, or one which I had made by the Folkers Brothers, of this city, when I had many operations of this character to perform, is very convenient. If you have experience you can operate with anything; select the instrument you prefer, practice with it, and you will soon become expert. Dupuytren, when in the zenith of his glory at Hôtel Dieu, once said to his class, If you have the head you can always find the hand. If you cannot use your own you can find one that will answer equally as well. Almost any person can use the knife efficiently when he is not responsible for the result. After the edges of the fistulous opening have been removed, and the sutures properly placed, the blood should be entirely removed and the edges approximated, either by tying the wire or twisting the edges so as to keep the surfaces in contact until the result can be determined. Opium or sulphate of morphia should be administered morning and evening. Sims's catheter should be attached to a tube to conduct the urine from the bed. Gruel, tea, chicken-water, barley-water, rice-water, and beef tea, provided the patient is debilitated, should be prescribed. The silver sutures should not be removed for seven or eight days, so that if union by the first intention should not take place, it might occur by granulation. The first operation I performed in this State, I used the clamps made of pieces of lead, perforated so as to admit a silver wire; the edges were approximated and the clamps held by shot through which a hole had been made. When the clamps were in a position to hold the edges in contact, the opening in the shot was closed, and the apparatus was not disturbed for ten days. The woman recovered, now lives in this city, and is perfectly well.

LECTURE XXXIX.

GENTLEMEN: This lecture will be devoted to diseases of the eye. Since you have a professor of ophthalmology, you should not expect from me a minute description of the anatomy and physiology of the eye. The reason I did not omit the diseases of this organ is, that the treatment of them is not half so efficient and effectual as it was twenty years ago. It is true the ophthalmoscope has been discovered, by which you ascertain the condition of the internal constituents of the eye much better than with ordinary vision. When the ophthalmoscope is used the room should be darkened and the patient placed under a gaslight, his back turned to the light, and the instrument held in front. The slightest opacity or organic disease can be detected, its character generally ascertained, and the proper treatment adopted, provided the oculist be honest.

The healthy eye is composed of various parts. The membranes are the conjunctiva, cornea, sclerotic, and retina. This is the surgical description of the coats of the eye. Anatomists frequently describe four or five layers of the cornea, the knowledge of which is of no practical importance, and affords no assistance in the treatment of such cases. Anteriorly you will find the conjunctiva and the cornea. They are both transparent; the former covers the cornea and sclerotic membranes, and lines the lids. Posterior to the junction of the cornea and sclerotic there are four membranes, the conjunctiva, the sclerotic, choroid, and retina. Internally the eye is divided into two chambers, the anterior and posterior. In the former you will find the aqueous humor, and in the posterior the crystalline lens and the vitreous humor. The former is situated posterior to and near the iris, and the latter fills the posterior chamber.

The most common disease of the eye in California is acute inflammation of the conjunctiva. This may result from cold, exposure to strong light after working many hours in a dark tunnel, or from a specific cause. In ordinary cases of conjunctivitis there is great intolerance of light, but in syphilitic conjunctivitis the patient can face the strongest light without any inconvenience. When photo-

phobia exists, with lachrymation, intense redness, and pain, the disease must be treated actively or the organ will be destroyed. You should open a vein in the arm, give purgatives, apply cold water, and in twenty-four hours, if decided relief has not been obtained, a half dozen leeches should be applied behind the ear of the affected side, and repeated every day so long as the pain continues; then a blister should be applied behind the ears, and a suitable collyrium recommended, four drops of which should be put into the eye three times a day. Should leeches be scarce, three cups, or the abstraction of blood by dividing the temporal artery, should be substituted, which will save many eyes, and deprive specialists of many fees, both for the operation and for artificial glass eyes. In syphilitic conjunctivitis the eyes may be red, yet there is no photophobia. In such cases apply to the eye a few drops of the solution of atropin, two grains to the ℥j of distilled water. You should also give the anti-syphilitic mixture already recommended in other forms of the same disease. If not properly treated, in a short time the pupil either closes or the member is disorganized, and consequently lost.

Unfortunately the diseases of the eye, both in this and other cities of the United States, are treated by quacks, many of whom do not understand the anatomy of the eye, and are entirely ignorant of the treatment necessary in every case. They have a routine treatment, and obtain their patients by runners, or, as they call themselves, solicitors. The patients are both robbed and maltreated, and when blind they must either be treated gratuitously or sent to the hospital, where they will receive proper attention.

In acute inflammation of the eye, a soft cloth wet with cold water should hang loosely over the affected eye, and when dry it should be wet again, and continued. To recapitulate, in acute inflammation of the eye the disease must be controlled by bleeding from the arm, arteriotomy, leeches, or cups, which should be followed by blisters and such constitutional treatment as the case requires. In such cases a few drops of the solution of nitrate of silver, grs. ij to ℥j of distilled water, should be applied to the ball morning and evening. This ought not to be continued long. If it should be, the conjunctiva and cornea are permanently discolored.

A very simple and useful collyrium contains the following ingredients: ℞. Alum. sulph., gr. xij; vin. opii, ℥ij; aquæ destil., ℥ij. Misce. Sig. Put a few drops in the eye three times a day. Some-

times I prescribe sulphate of zinc, two grains to the ℥j of distilled water. One of the best applications that I know of is the solution of the perchloride of iron, twenty drops to the ℥j, although it may be made much stronger, and used with a decidedly good effect. In ordinary cases of ophthalmia, a few leeches behind the ear, followed by a blister, with cold applications to the eye, with any of the preparations above mentioned, will in a few days relieve the inflammation.

The most distressing disease of the eye is called strumous ophthalmia. The eye is seldom red, but a few enlarged vessels may be seen extending generally from the corners of the eye, and when they reach the cornea a small ulcer generally appears. Should these enlarged vessels be touched with nitrate of silver near their origin, they will disappear, the ulcer will heal rapidly, and with proper constitutional treatment the difficulty will not return. The question now arises,—what constitutional remedies should be recommended? Dr. Mackenzie, the distinguished oculist of Edinburgh, recommends sulphate of quinia. He gave to a child two or three years old two grains three times a day, and applied a solution of nitrate of silver, grs. ij to the ℥j, to the eye morning and evening. I think I have improved Mackenzie's treatment by combining with ℥j of sulphate of quinia ℥j of the fluid ext. sennæ to three ounces of simple syrup. This is the best internal remedy that can be given. When the photophobia is distressing, give the internal treatment. Use the collyrium recommended, apply a blister behind the ear, and the difficulty will soon be controlled. Should this disease attack adults, the photophobia is excessive, the patient, if a young lady, is obliged to wear a double green veil, the blinds must be closed, and the curtain lowered so that the least possible light shall enter the apartment. You will in such cases prescribe—℞. Qui. sulph., ℥j; pul. rad. rhei, pul. rad. sanguinariæ Canad., ext. cicutæ, āā ℥ss. Misce. Ft. pil. No. xxx. Sig. Take one pill four times a day, and use in violent cases the two-grain solution of nitrate of silver locally to the eye. In ordinary cases use the solutions of alum, zinci sulph., or any other simple solution, and until the photophobia disappears the upper eyelid should be inverted and touched with sulph. of copper every alternate day, until the eye is cured. Some oculists in such cases recommend cod-liver oil internally, but I want you to remember that the effect of cod-liver oil is trifling in comparison to that which results from

the combination which I have given. When you graduate, give cod-liver oil to one patient and the quinia mixture to another, and then you can decide correctly. Many children with this disease are scrofulous. Sometimes this difficulty is complicated with eczema of the scalp, and sometimes of the entire body. Of the latter trouble I think I have already spoken; if not, the professor of the diseases of children will lecture upon it, as it is one of the most common and distressing diseases by which they are afflicted. Many years ago I was called to a child fifteen miles from the little town in which I lived; when I arrived the patient, a girl about ten years old, who had scrofulous ophthalmia, could not be found, and finally the mother dragged her from under the bed with her hands held to her eyes, and screaming for fear that she would be forced to expose them to the light. I introduced a seton in the back of the neck, gave her sulphate of quinia and syrup of rhubarb, with a two-grain solution of the nitrate of silver to the ℥j of water. In a few weeks the patient was well, and so long as I remained in Columbia the trouble did not return. In all cases of this character, prescribe a generous diet. Fresh meat, cream, milk, and such food as is known to contain the phosphates; corn-meal, sweet potatoes, beans, peas, cracked wheat, and other articles of diet of like character. For the last ten years there has scarcely passed a day without my seeing a case of this character in my office. The child is generally a blonde, with light or red hair, and so fat that you would regard it as a model child if either some one or all of the evidences of scrofula did not exist. Give quinine and the fluid extract of senna to children, feed them well, and under such circumstances I have never failed to cure a difficulty of this character. When the disease attacks older children or adults, then give the pills recommended; evert the upper eyelid and apply the sulph. of copper every alternate day until the photophobia has entirely disappeared and the sight is restored. After the application of the nitrate of silver to the lids, a weak solution of common salt should be applied, which will limit the action of the caustic, and very soon the disease will disappear. In cases of strumous ophthalmia of children, I sometimes use the solution of alum, but nothing is so efficacious as the solution of nitrate of silver. When used you should always recollect that if long continued it renders the conjunctiva and cornea permanently yellow, which may be dissected off or removed; this may cause an adhesion

of the ball and lids, and when the ball moves, the lids, being attached, must perform the same motion. The adhesions between the lids and ball of the eye can be divided, but considerable time and patience are required to remove the difficulty so as to render the patient comfortable, and that may be accomplished with the knife, nitrate of silver, and common salt. A classmate of mine in school was a patient of mine; we had read Virgil and Homer together. I always read the first half of the lesson, which he did not study, and he the remainder. He recited half of the lesson and I studied the whole. Being a schoolmate, I gave him especial attention. He was poor and I was rich, and consequently I was more than willing to give him extra attention in order to put him in a condition to support his wife and children.

There is another form of inflammation of the eye which is exceedingly violent, and may exist both in children and adults. It is called purulent ophthalmia. You will meet with cases in children from two to fifteen or twenty days old. The lids are swollen and distended by the purulent secretion, which forms very rapidly, and should be allowed to escape frequently. This disease resembles gonorrhœal ophthalmia, and I think generally results from the eyes not being properly washed with tepid water soon after delivery. I think it may be produced by exposing the eyes to a strong light. In such cases it is very difficult to get a view of the ball of the eye, and indeed I rarely attempt it. This disease is easily cured if treated before disorganization takes place. You should apply a four-grain solution of the nitrate of silver to the ball and lids. Do not trust either the mother or nurse to apply the solution. A small camel's-hair pencil should be selected; the hair should be cut off with scissors close to the quill. It should then be dipped into the solution of the strength indicated, and passed between the lids, and brought in contact with the entire conjunctiva. This application should be repeated morning and evening, and the lids should be separated at least every hour, in order to allow the purulent secretion to escape. This treatment in my hands has never failed. Some use a ten-grain solution of sulph. alumina, other physicians apply a solution of acetate of lead: to this I decidedly object when the cornea is ulcerated; the lead adheres to the ulcerated surface, and we do not know of any application that will combine with and remove it. I have already said that I have never lost an eye that was treated early,

that is, soon after the appearance of the disease, since I adopted this treatment, which was published by Mackenzie at least thirty years ago, and I do not think that the diseases of the eye are more skilfully treated than they were thirty years since. The treatment is not so efficient; eyes are often lost when they should be saved. It is always more profitable for a dishonest man to destroy an eye or allow it to become blind by inefficient treatment, than to prevent by proper treatment the destruction of the organ.

There is another difficulty which occurs frequently, but is so destructive that but little time is allowed for treatment before the eye is disorganized. It is produced by gonorrhœal matter coming in contact with the membranes of the eye. The conjunctivitis is excessive, the membrane inflames so much and the swelling is so great that the circulation in this membrane is interrupted, and the cornea sloughs, which destroys permanently the function of the organ. Sometimes a patient complains of a sore eye, and in twenty-four hours the eye may be disorganized. The course which I invariably pursue is that recommended by Sanson, one of the surgeons of the Hôtel Dieu, the best hospital in Paris. After the inflammation has existed a few hours, apply a bandage to the arm, open a vein, and bleed the patient until syncope is threatened. Then remove the swollen mucous membrane which surrounds the cornea and produces the projection called chemosis. I always remove a portion of the entire membrane, and then the bleeding should be repeated if necessary; leeches, cups, and blisters should be applied, and after the removal of the conjunctiva, solid nitrate of silver should be applied to the lids, and repeated if the circumstances of the case require its application. In such cases I do not bleed by the ℥j, but allow the blood to flow until syncope is threatened. Should the appearance of the eye not improve, and the pain continue, venesection should be repeated. This is the course I have always pursued, and I can say that when I was called to a case before disorganization had taken place, the eye was always saved. Previous to Sanson's day the disease was considered incurable. I know that it is useless to try to save an eye under such circumstances by any other method of treatment. In ordinary cases of inflammation of the eye, the cornea may be ulcerated; and when the ulcer heals, a white spot remains, which is called leucoma. When the ulcer occurs over the pupil, this is sometimes a serious difficulty, and if by the use of the ordinary applications, including the

sulphate of copper to the lids, it is not removed, then an artificial pupil can be made, which may partially restore the use of the eye, and very little deformity will remain. A nebula or cloud generally occurs in strumous cases, and results from the enlarged vessels of the sclerotic passing over the cornea, which to some extent obscures the vision. Treat it as a case of strumous ophthalmia, with quinine and laxatives and the local treatment already recommended, and you will rarely fail to remove the difficulty. Should that course fail, then give chloroform; have the lids secured, and pass a point of the nitrate of silver around the ball, so as not to touch the cornea; by this all the enlarged vessels are destroyed, and the cause being removed, the effect must speedily disappear. After this application, a weak solution of common salt should be employed, and morphine or McMunn's elixir of opium exhibited until the pain is relieved. After this application you will be astonished at the improvement that takes place, if the difficulty has not existed a long time. When effusion occurs between the layers of the cornea in consequence of the existence of inflammation of that membrane, the lymph deposited becomes organized, and results in an opacity called albugo. It is not a cicatrix, which results from the healing of an ulcer, but really an opacity resulting from the effusion and organization of plastic lymph between the layers of the cornea. An enlargement of the vessels is produced generally by the excessive use of the eyes. The vessels are very conspicuous; and when they pass over the cornea until they reach the centre, the sight is impaired. When this difficulty commences, pass the nitrate of silver across the origin of the vessels, and in nine cases out of ten a surgical operation will not be necessary. When it does become necessary to operate, raise the diseased portion of the conjunctiva with forceps, dissect it off with a scalpel, and bring the edges of the wound together with the interrupted suture; they will unite by the first intention. After the common operation a fungus generally appears where the incision was made, and the best course is to apply the sulphate of copper every alternate day until the fungus disappears. Should that be large, remove the tumor, apply nitrate of silver to the site, and then use the sulphate of copper.

LECTURE XL.

GENTLEMEN: The next disease of the eye to which I will direct your attention is staphyloma. The size of the projection depends upon the extent of the ulceration. When an ulcer forms upon the cornea, a portion of the tunic is destroyed, and the remainder weakened, so that it very soon yields to the internal pressure, and a tumor is formed. When the entire cornea is ulcerated, the protrusion is so great that it cannot be covered by the lids; consequently the protrusion may be either partial or general. When partial, it results from a small ulcer, and sometimes the difficulty can be relieved by puncturing the projection with a needle, and touching it with nitrate of silver, by a repetition of which treatment the parts are thickened by the deposition of plastic lymph, and become sufficiently firm to resist the pressure of the contents of the eye. Should this fail, apply a thread of silk to the projection, tie it tight, cut the ligature close to the knot, and you can calculate with great certainty on success. But when the staphyloma involves the entire cornea, you must either remove the eye, or pass a tenaculum through the tumor, and apply a strong ligature, and often you will obtain a suitable stump for an artificial eye, which should always be considered. An artificial eye without motion is scarcely an improvement. The sclerotic membrane, which is fibrous, dense, and strong, sometimes inflames, and the pain under such circumstances is always acute. Being of a rheumatic character, it will only yield to the remedies suitable in such cases. When this difficulty is neglected the membrane becomes softened, finally yields, and staphyloma appears. I have met with and treated several cases of this character, which appeared under the upper lid at first. I removed the tumor with the tunics; subsequently iridectomy was performed through the sclerotic coat, and in every instance the pain ceased, and the sight was not lost. The patients were all kept under the influence of the following mixture: ℞. Iodid. pot., ʒiv; vin. col. sem., syr. zingiberis, āā ℥iss.; tinct. aconiti rad., ʒiss.; fluid ext. cimicifugæ, ℥ij. M. Sig. Take one teaspoonful three or four times a day. This prescription in-

cludes everything that is useful in rheumatism, no matter where it may be located, and until the constitutional remedy has time to act, the pain can be relieved by the application of leeches behind the ears, and the use of a grain of sulphate of morphia to a blistered surface produced by the application of ammonia, as already directed. I am opposed to the hypodermic use of morphia under all circumstances, not because it does not afford relief, but in consequence of the means by which it is obtained being so convenient and attended with so little pain, the temptation to repeat the operation when the pain has disappeared is so great that few can resist it, and ultimately a habit is formed which is ruinous, both physically and mentally. In iritis, which may be either simple or specific, the pain is deepseated, the pupil is generally contracted, irregular in shape, and grayish in color. In syphilitic iritis you frequently find these peculiarities, and if the disease is not properly treated, a secretion of pus takes place, and the pupil closes. Anti-syphilitic remedies should be administered. Give calomel and opium, āā, half a grain four times a day. Drop into the eye a solution of atropin, two grains to the ℥j, three or four times a day. Even in simple cases of iritis give calomel and opium, use the atropin, and resort to bloodletting, as may be indicated by the violence of the disease and the condition of the patient. Should the pupil close and remain in that condition, lymph is secreted, becomes organized, and the occlusion is permanent even after the inflammation is controlled. The sight of the eye can then be easily restored by making an artificial pupil. Some of the members of the present class witnessed an operation in the hospital during the last course of lectures, which was successful. I found a patient in the County Hospital who had been there over two years. Wilde's sharp-pointed scissors were passed through the cornea at the inferior portion, the blades being approximated, and an incision was made. Professor O'Neil, who was then my student, caught the iris, drew it through the opening; a portion was removed and the iris returned. In three or four weeks the patient was entirely well, and employed in the institution as a nurse. Dropsy of the eye is not uncommon. It is produced by an accumulation of fluid in the chambers of the eye, which expands the ball, and sometimes destroys the sight. In consequence of the dark color of the secretion, it is called dropsy of the choroid, and when the fluid accumulates so that the pressure produces an ab-

sorption of the tunics and an irregularity of the enlargement, the dark color is perceptible. In such cases puncture the eye where the coats are thinnest, with a cataract needle, so as to allow the fluid to escape. If a cure is not thus effected, pass a tenaculum through the projecting point, and remove it with a scalpel, so as to allow the fluid to escape, and in nine cases out of ten it will not return, and the eye will perform its function as well as ever. When the secretion becomes sufficiently great to produce pressure, there is much pain, and an opening must be made to allow the fluid to escape. A very common and very serious disease of the eye is called amaurosis. It is caused by inflammation of the retina. The pain in such cases in the eye and head is intense, and it may be distinguished from any other disease of the eye by the fact that flashes of light or sparks like those from a fire annoy the patient, whether he be asleep or awake. Whenever these symptoms are decided, you should feel sure that you have to contend with inflammation of the retina, which requires the most active treatment to remove. In such cases blood should be abstracted either by cups or leeches, before the patient is paralyzed, when the case is generally hopeless, because the disease has extended to the spinal cord. I have cured many cases of amaurosis, both in my native State and in California, by the abstraction of blood, at least three times a week, either from the temples or behind the ears, by cups or leeches. A case of this character cannot be cured except by the abstraction of blood, combined with the anti-syphilitic mixture which has already been mentioned. Formerly I employed a cupper, but as cupping is rather a painful operation, I now generally abstract blood by leeches. They should be applied behind the ears, and by the application of cloths wet with warm water the flow of blood should be encouraged. In addition to the abstraction of blood, the bowels should be kept open, and the alterative above specified be administered.

Have the hair shaved off of three inches square of the scalp, and apply Birt's blistering fluid two or three times a week, or as often as may be necessary to establish and keep up constant irritation. Blisters to the scalp are preferable to those behind the ears, because a larger surface can be attacked, and more irritation produced without interfering with the abstraction of blood. By the treatment I have recommended in the diseases specified I think I can conscientiously say that I have not been mistaken, and have always prevented the

disorganization of the eye, provided it had not occurred before I was required to treat the case. The crystalline lens I think I have not described, because I expected to exhibit the lens of the ox. It is situated behind the iris. This membrane extends from the junction of the cornea and sclerotic coats, directly across the eye, and in the centre is an opening which is called the pupil. The anterior chamber extends behind the pupil and is filled by the aqueous humor. Just behind, and posterior to the anterior chamber, we find the crystalline lens, and behind it the vitreous humour. Cataract is an opacity of the crystalline lens, or of the capsule by which it is covered. In children the cataract is white, which is generally called flocculent or fleecy, and can be cured simply by lacerating the capsule of the lens. Sometimes the color is gray or brownish, which is generally the case in adults, and particularly in old age.

The lens in cataract is said to be sometimes black. I saw Jobert, at the St. Louis Hospital, operate for what he called black cataract in a case of amaurosis. He extracted the lens, of course without a beneficial result. I recognized the patient as one I had seen at the Hôtel Dieu, and recollected that Dupuytren said it was amaurosis, and that an operation would not restore the sight. The same mistake was made in this city in 1854, and the patient, who was under treatment in the United States Marine Hospital for amaurosis, was persuaded to leave that institution, which was then under my control. His eyes were operated upon for cataract, and he is now a living illustration of the necessity of making a correct diagnosis in such cases, and will serve as a caution to those who are always ready and willing to operate upon anything regardless of consequences, provided they can obtain notoriety. A singular case occurred in my practice recently. I operated upon a woman for soft cataract by laceration of the capsule. In a few weeks the cataract disappeared, and her sight, with the assistance of a glass with a three-inch focus, was as good as before the lens became diseased. In a few months, however, I ascertained that she had capsular cataract, which I think was produced by the constant use of the eye, which should have been favored. Two weeks since I removed the capsule through the cornea, and now the sight is as good as after the first operation. In persons more advanced the lens presents a brownish appearance, and sometimes resembles amaurosis or iritis, when pus is secreted by the inflamed vessels. When in doubt, use the atropin, 2 grs. to

the ℥j of distilled water, three or four times a day, and the following morning, by the use of the ophthalmoscope, a correct diagnosis can be made. In amaurosis a gray appearance is presented, in cataract either a white or brownish substance intervenes between the pupil and the vitreous humor. The causes of cataract are not easily ascertained, except in such cases as are produced by violence. After the receipt of an injury, several months may elapse before the discovery is made that one eye is defective. An oculist is at length consulted; he finds a cataract in the eye that sustained the injury, and extracts the lens. The eye is now blind, and the difficulty cannot be removed by any subsequent operation. I recollect a blacksmith who was injured by a piece of iron striking his eye; a cataract formed. I watched the case, and in three or four months the cataract was extracted, and the eye was apparently perfectly well, but in order to render the sight equal in both eyes, a glass with a three-inch focus should cover the injured eye, and a plain glass should be used for the other. You should never operate upon a cataract of one eye when the other is not affected. I once operated upon one eye, the sight of the other not being very good. The patient was a colored servant; with both eyes exposed he could not cut a stick of wood. He was obliged to cover the eye upon which the operation was performed, and to keep it covered until the sight of the other eye was so much improved that he could perform the duties required of a servant. I then depressed the cataract of the other eye, and in two weeks the sight was not only restored, but no inconvenience was experienced.

You should never operate for cataract by an injury if the other eye is perfect, lest both eyes be destroyed. If saved, the focus being different, but little benefit will result from the operation, and the other and healthy eye may be involved and the sight destroyed. A case of this character occurred in my native State. One eye was injured by the accidental explosion of powder; Dr. Wells operated upon the affected eye, the other eye became implicated, and was saved only by venesection, leeches, cups, blisters, and evaporating lotions.

Should no inflammation follow the operation, in one eye you will find a lens, and in the other none. The sight is so much confused that the condition of the patient is more uncomfortable than before, and he is either compelled to cover one of the eyes or have the lens removed from the other eye, in order to render both eyes useful at

the same time. The question now arises, how a cataract can be cured in young persons when it is flocculent, or in children when the sight is defective in consequence of a laminated condition of the lens, which is only partially transparent? I have always succeeded by laceration. When the capsule is lacerated, the lens is dissolved by the aqueous humor. In hard cataract, the lens dissolves very slowly when lacerated, and consequently I have always performed the operation practiced by Dupuytren, at the Hôtel Dieu. In soft cataract the lens was lacerated, and not otherwise disturbed, and when the cataract was hard, it was removed from the axis of vision and allowed to remain. I watched the result and compared it with the result of Professor Roux's operations. He performed the flap, and always extracted. The incision was made upon the external and lower side of the cornea; the capsule of the lens was divided with a small knife, and the lens removed from its natural position and forced through both the pupil and wound.

Roux was so popular as an operator that I saw him perform the operation for cataract by extraction on twenty-eight eyes before he left his seat. Dupuytren, during the month, generally operated upon five or six every morning by candlelight. I watched closely every case that was operated upon in both La Charité and Hôtel Dieu, and I had abundant evidence that laceration and couching were more successful than extraction, as then practiced, by the flap operation. I noticed that the wound of the cornea failed to unite by the first intention; sometimes iritis followed the operation, and not being treated actively, the sight was lost. I adopted Dupuytren's treatment in such cases, and if I live to lecture ten years longer, I will advise every class to pursue the course which has been so successful in my hands.

When you desire simply to lacerate the lens, pass a cataract-needle either above or below the centre of the external surface of the eyeball (if curved, turn the convex side to the iris). When the needle can be seen through the pupil which has been dilated, then change the position, and if the cataract is soft, lacerate it, and if hard, pass the needle over the lens and press it down into the posterior chamber, or in other words, into the vitreous humor, where I have never known it to produce either inflammation, irritation, or paralysis. I was the only surgeon in the interior of South Carolina who did operate upon the eyes, and who had independence enough to use the

lancet, and I can say that I never lost but one eye after an operation for cataract, and this patient positively refused to submit to venesection or the abstraction of blood by other means when inflammation occurred. When the lens is depressed, the light can pass into the posterior chamber of the eye through the pupil. After the operation for cataract, the sight is not so good, but by the use of glasses the patient can read ordinary print, and the sight is sufficiently restored for the transaction of any business. The operation by extraction is now almost universally practiced, and for that purpose the best instrument I have ever used is Wilde's iridectomy scissors. With them you can make as extensive an incision as may be necessary, with less difficulty than with any other instrument.

The operation for cataract by linear extraction only differs from any other in that the incision is made in the upper portion of the cornea instead of in the lower. In skilful hands, I have no doubt this has its advantages. After the incision of the cornea has been made, then the capsule should be divided, and by gentle pressure, the lens should be removed. I have occasionally performed this operation, and generally—unless the pupil has been closed either by a wound or by inflammation—the sight has been restored; if not, the operation of iridectomy may be necessary to restore vision. In soft cataract, it is immaterial what operation may be recommended, always lacerate. When the lens is soft, operate through the cornea. Dilate the pupil with two grs. of atropin to ℥ij of water, and then pass the needle through the cornea and lacerate the capsule. That operation is called keratonyxis, and when the needle is passed through the sclerotic coat, it is called sclerotonyxis. In all cases, before operating for cataract, the pupil should be dilated by atropin.

For holding the lids apart, the instrument exhibited is very efficient, and I do not think it can be improved; time would only be lost in the search for other inventions. Sometimes the eye becomes cancerous, and should be removed according to the size of the surrounding parts that are implicated. Raise and divide the conjunctiva, which will allow the finger to pass between the eye and the orbit, so as to break up any adhesions that may exist, and enable you to apply a ligature to the vessels and nerves sufficiently tight to destroy the sensibility of the nerves and control the artery so effectually as to prevent hæmorrhage. When entropium exists, the eye can-

not be entirely opened; the eyeball is either inflamed or the cornea opaque from the irritation produced by the lashes rubbing constantly upon the ball. When entropium is complicated with an inversion of the lashes, the difficulty is called trichiasis. Entropium is not uncommon, and is almost always produced by neglected strumous ophthalmia. The only operation that can be performed successfully is to remove a sufficient portion of the eyelids with the subcutaneous cellular tissue, and confine the surfaces of the wound in contact, and allow the ligatures to remain until union is perfect; a second operation is seldom required. Should the difficulty return, the operation may be repeated with success.

Ectropium is regarded as a much more unmanageable difficulty, but I must confess that I would much rather treat a case of this character than one of entropium. In ectropium, the inside of the lid is turned outward, the mucous membrane is exposed and presents a peculiar red appearance, which is always very unpleasant; the eye suffers from light and dust, and often becomes inflamed. When I came to California, in 1852, I had never operated upon a case of this character. Very soon the wife of a clergyman, who had ectropium of both lids, applied to me for relief. By the assistance of one of my best students, the lower eyelid was dissected out without injuring the cartilage. A portion of skin large enough to fill the wound was taken from the temple, turned upon its pedicle, placed in the opening, and secured by interrupted silver sutures. These should be allowed to remain six, seven, eight, or ten days, and then be removed. The upper lid was more everted and disfigured than the lower. When the first operation was successful, I dissected the cartilage and mucous membrane from the parts to which it was attached. A piece of skin was taken from the temporal region, which was placed in the position required to remove the deformity, and held there by sutures.

In such cases a failure cannot occur. Some years since, a girl was brought to this city with ectropium of an aggravated character, produced by the horn of a vicious cow. The under lid was everted. I told the mother that it was necessary to dissect up the lid, take a piece of skin large enough to hold the lid in its natural position, retain it in that position until union occurred, and then she would be well. She decided that she would not submit to any such barbarity. She employed an oculist and a surgeon. They performed seven

operations, and after each operation the difficulty increased. She finally paid their bill and employed me. I transplanted a piece of skin, and the deformity was removed, but I am sorry to say that she did not express any gratitude for the attention which I rendered. Cases of ectropium are sometimes due to the action of fire, or the rays of the sun. The face is blistered, and when the blisters heal, the cicatrix contracts, and the eyelids are everted. You should always stop and tell the mother to grease the face with mutton-suet after it is washed, but not with soap. Soap should never be applied to the human skin, and oil (either mutton suet, almond oil, or olive oil) should be applied every day, as oil protects the human skin.

Encanthus is a tumor near the inner corner of the eye; sometimes it is quite large; it is vascular, and occasionally presents a granulated appearance. The only treatment necessary is to apply a ligature. You will find by experience that the ligature is the most successful method of treatment. When it is detached, there is scarcely a possibility of return of the tumor unless it be malignant.

Epithelioma.—If you recollect, I described this as a semi-malignant tumor, which, when neglected or irritated, may return. To distinguish it from cancer, it is called sometimes cancroid. In epithelioma of the eyelids, you must remove the parts implicated, and supply the defect from the adjoining healthy tissue. In the cases represented in Figs. 42 and 43 (pp. 134–5) a portion of the upper and under eyelids were removed, and very little deformity resulted. The man had not as much control over the lids as he had formerly, but his sight was not impaired.

Fistula lachrymalis generally results from the obstruction of the lachrymal ducts and the carelessness of the patient. When the duct closes, the tears accumulate in the sac, and if that is not emptied by pressure several times a day, it inflames, pus is formed, the skin ulcerates from distension, and a fistula lachrymalis is the result. This can be cured by passing a round-headed probe through the puncture. I do not use Anel's, but one which I had made by Glaze and Radcliffe, of Columbia, South Carolina, and with it I cured a patient after Delafield and a celebrated oculist of New Orleans had failed. Before I left the State, Mrs. Preston, the patient, could pass the probe as readily as I could, and she was

permanently cured. When your patients are not wealthy, and live at a distance from you, you should have a tube like Dupuytren's, made of pure gold; cut an opening into the lachrymal sac, pass a curved director through the duct into the nasal cavity, which should be followed by the gold tube exhibited. The external wound will heal readily, and the head of the tube being concealed, no deformity will or can result. I am now treating a patient from Chico, who has dyspepsia, and, having seen her before, I asked her if she had not been my patient. She said that her eyes, when a girl, were very weak, and when she came to San Francisco her relations sent her to me, and that I inserted a gold tube, which has remained fifteen years without producing the slightest inconvenience, and the only evidence that an operation was performed is that a yellow and rough spot remains. Formerly a seton was passed from the fistulous opening to the nose. Subsequently a stilette of gutta percha, with a head, was passed through the duct and allowed to remain until the canal was permanently re-established. After the stilette is withdrawn, the stricture frequently reappears; but if the Dupuytren tube, made of pure gold, is inserted, the wound heals over the tube, and the patient is permanently relieved.

When you desire to steady the eye, always use the blunt forceps; they take hold of the conjunctiva and control the movements of the eye without causing much pain. A delicate instrument would slip and the operation be delayed, until the broad forceps were used, which are found in every properly prepared case, entirely sufficient to control the movements of the eye under any circumstances.

I was the first surgeon in America who performed the operation for strabismus, and I now allude to the fact in order to encourage the members of this class to take the journals, so as to keep themselves familiar with the literature of the profession. I then read the quarterly, published in Philadelphia, called the *American Medical Journal.* I also read the *Medico-Chirurgical Review*, published in London. I also took and read a local journal, and contributed very liberally to its columns.

When the eye occupies an unnatural position, the deformity depends upon either a congenital shortening of the muscles or upon a contraction of the rectus muscles. I have already described the different varieties of this deformity, and it is not necessary now to repeat what was then said. The lids being secured, have the eye-

ball steadied by an assistant with blunt forceps; then raise the conjunctiva with small forceps, snip a small portion, or divide the part elevated with a tenotomy knife; pass a small curved director under the tendon of the muscle, and divide it by passing the blade along the groove until the resistance ceases. When the muscle is very much shortened, I generally pass a small pair of curved scissors under the director, so as to remove a portion of the tendon raised up, which will enable the eye to resume at once its natural position. This operation is generally simple, although many fail, after the tendon has been properly divided, for want of experience. Should the eye be disposed to turn too much in a contrary direction, then the eye should be covered and the other exposed, until they both present the same appearance, and they should be exposed to the light, being simply protected by a shade. Should the eye operated upon have a disposition to retain its original position, then it should be exposed and the other covered until it presents a natural appearance, and when that occurs, expose both. In females, the eye is greatly disposed to turn in the opposite direction; hence the tendon should only be divided and the eye covered until it unites, provided there is a tendency to eversion of the ball. Gentlemen, I have always read the journals, and about 1840, I read in the *Medico-Chirurgical Review*, that Dieffenbach had performed that operation successfully for strabismus, and before my competitors were aware of the fact, I had operated upon at least half a dozen cases, which gave me all the ophthalmic surgery in my native State, as well as in the upper part of the two adjoining States.

When a fungus appears where the incision was made, apply the sulphate of copper every alternate day until it disappears.

LECTURE XLI.

GENTLEMEN: There is another subject of very great importance to which I have not alluded. It is important to medical men, and particularly to young practitioners, and that is spermatorrhœa. You will find, when you engage in practice, that almost every person who has practiced masturbation thinks he has spermatorrhœa. This impression is made by reading the tracts distributed by charlatans, both in this and in other States. It is a misfortune that this is true, although I have no doubt that it has rescued many valuable men from ruin, who would not have been aware of the consequence of excessive indulgence until they were destroyed, both physically and mentally. These publications, however, are calculated to injure the illiterate, since, after reading productions of this character, they believe that the slightest escape of semen must soon prove fatal, and they will give their last dollar to any man who calls himself a physician. They think constantly of the dreadful fate that awaits them, and ultimately the health becomes impaired, and very soon they are found in the lunatic asylum, or I should say asylums, for the asylum at Napa is being rapidly filled; the other at Stockton contains more than a thousand lunatics, and many have resulted from this cause. The loss of semen is natural; it is necessary; and it only becomes a disease when excessive. After an erection either prostatic fluid or semen will escape. That is the natural consequence of an erection in young persons; it is, therefore, not disease. A man of intelligence can be made to understand this, but illiterate and otherwise ordinary men cannot be convinced by reason, and these are the most troublesome cases that you will ever be required to treat. They only apply to the best regular physicians after they have been robbed of their money. In many cases they have paid every cent they possessed to an uncompromising and dishonest quack. These publications have been pecuniarily very beneficial to me, because the patients of the better class soon detect humbug. Such patients pay liberally, because no regular physician charges more than the legal

fee, and they have been charged so exorbitantly by a man who is entirely ignorant of the first principles of medicine. I once appeared as an examiner with Dr. Henry Gibbons, of a notorious quack of this city, who had sued another quack for libel. The charlatan did not know where the liver was located. He failed to answer a single question, and then withdrew the suit, sold his diploma, and retired. You should say to every patient that it is impossible to prevent nocturnal emissions entirely; but when they occur so often as to produce both local and general debility, by proper treatment the recurrence can be reduced to once a week, and even sometimes to once a month. The most frequent cause is masturbation. Excessive indulgence is another fruitful source of the disease. It frequently follows gonorrhœa, and results from the irritation of the prostatic portion of the urethra which remains after the discharge.

Causes.—It sometimes accompanies stricture, varicocele, or any irritation either of the prostatic portion of the urethra or of the neck of the bladder. The irritation of the parts specified causes an increased secretion of semen, which must escape, and which will escape more frequently than if the parts were in a healthy condition. Sometimes the semen passes when at stool, very frequently at night during dreams, which at first afford pleasure, but ultimately the fluid passes with only a partial erection, and without the slightest pleasure. In this state the condition of the patient is very unhappy. The seminal fluid changes its character, becoming thinner and more abundant; ultimately the body smells like semen. The digestive organs in some cases are deranged; there is troublesome flatulence, with constipation; palpitation of the heart generally exists; the nights are sleepless, and the patient becomes stupid and cowardly. The unfortunate victim is almost always impotent; although it is impossible to have an erection, the least excitement causes a discharge of semen. The first officer of the ship in which I crossed the Atlantic became paralyzed from this habit; and when he was unable to use the hands, having some control over his arms, he managed to produce the desired effect in that manner. This man died in the Marine Hospital at Havre a few days after the ship landed. It is perfectly astonishing that men of ordinary intelligence will indulge any passion to the extent to which it is often practiced. I saw in La Charité Hospital, in Paris, a young man, who had disease of the spine. He was emaciated and miserable, and acknowledged that he

had masturbated three times a day for more than seven years. Boyer thought that the disease of the spine was produced by that cause. Another case is described in Richerand's Physiology of a shepherd, I think a Swiss, who had masturbated until he could not produce an emission by friction, and had actually split the penis, so as to find a portion of the urethra on which, by using a straw, the desired effect could be produced. So soon as the part exposed by the operation lost its sensibility, the cutting was repeated until the urethra was divided below the scrotum, and on one occasion he unfortunately passed a foreign body into the bladder, and was admitted into the hospital to be treated for stone. Sometimes, in cases of spermatorrhœa, the general health remains good, but sooner or later the patient becomes impotent. Of course a case of this character requires different treatment, which will be specified when that form of the disease is under consideration.

You should be careful not to mistake a discharge of mucus for semen. I can generally distinguish between them by the fact that semen adheres to the fingers when touched; but if doubt exists, the fluid should be examined with the microscope, when its character can be easily determined. Many years ago a celebrated French physician supposed he had discovered an infallible remedy for spermatorrhœa; he wrote two octavo volumes on the treatment of this disease by the use of nitrate of silver combined with constitutional remedies. His success, I am satisfied, depended more on the constitutional than local treatment. I have used the porte-caustique times innumerable, over a month, as recommended by Lallemand, every two weeks, every week, and sometimes every two or three days, and I can conscientiously say that I have never in my life obtained, by the use of that instrument, the slightest benefit. I have not, unless requested by a patient, used the porte-caustique for fifteen years, and I do not think I ever will use it again unless it may be necessary to cauterize a local irritation of the urethra. About fifteen years ago, an old physician of San Francisco, who did not practice, asked me if I had ever used the extract of belladonna for the purpose of invigorating the urinary organs; he said that he, although over sixty years of age, after taking it for two or three weeks, found that the venereal propensity returned with more vigor than had existed for ten years. Being aware that the extract of nux vomica was the best tonic known to the profession generally, and that it

acted specifically upon the genital organs, I made this combination: ℞. Quiniæ sulph., ʒj; pulv. rad. rhei and ext. nucis vom., ʒss.; ext. bellad., gr. xij. M. Ft pil. No. xxx. Sig. Take one pill four times a day. Should the patient be large, you can recommend four pills a day. In cases accompanied with daily emissions, with debility, constipation, and indigestion, if the pills recommended do not produce the desired effect, you can give the following combination: ℞. Ext. sennæ, ʒiij; tinct. nucis vomicæ, ʒix; tinct. bellad., ʒiiss.; tinct. aconiti rad., acid. hydrocyanici, āā ʒiss. M. Sig. Take one teaspoonful four times a day.

Such patients should be fed well, the bowels should act every day, and they should abstain from the popular dish in this city composed of corned beef and cabbage. The latter often attains the weight of forty-five pounds, and is not digestible; it is only preferred by laboring men in consequence of its lasting qualities. In cases in which there is excessive irritability, with good general health, I would, under all circumstances, prescribe the following mixture: ℞. Potass. bromidi, ʒv; ext. sennæ fl., ʒiij; tinct. belladonnæ, ʒiiss.; tinct. aconiti rad., acid. hydrocyanici, āā ʒiss.; syr. simplicis, ʒiiss. M. Sig. Take one teaspoonful four times a day. The patient should live temperately, take active exercise, and in a short time, great improvement will be perceptible, and particularly when the dyspeptic symptoms are prominent. I am satisfied that nearly one-half of the cases of insanity in the lunatic asylums have resulted from masturbation. They very soon lose all sense of decency. Yesterday morning, at the County Hospital gate, I saw a man masturbating. He was a thin, pale, emaciated wretch, and has undoubtedly brought himself to that degraded condition by masturbation. At the almshouse in this city, I have ascertained that there are fifteen or twenty wretches who are not demented, but who masturbate without regard to those present. This is in one of the best-managed institutions in the world.

I think that the legislature should pass a law to punish every man or woman who cannot resist masturbation; the former should be castrated, and the latter subjected to removal of the clitoris and nymphæ, and the application of croton oil; should that fail, then they should have their hands tied and be watched constantly until the habit is destroyed.

There is, as I before stated, another difficulty which results from

this habit, and that is impotence. I have already directed you how to treat a condition of this character. When the general health is good, give the bromide of potash, bellad., senna, aconite, etc. Impotence, when the patient is healthy, results from two causes. First, want of confidence. When a man visits a woman under suspicious circumstances, and fails from the fear of detection, he should never renew the effort unless the night can be spent with her, and all dread of exposure is removed. Impotence may result from excess, but I think the most common cause is masturbation. When there exists in young girls incontinence of urine, I am generally suspicious that it has resulted from masturbation. This difficulty should be attended to promptly and efficiently, as previously recommended.

LECTURE XLII.

SKIN-GRAFTING.

M. L. Reverdin discovered, in 1869, that skin taken from a different part of the body and applied to an ulcerated surface, would adhere and hasten the cicatrization of the ulcer. He grafted the epidermis with as small a portion of the cutis vera as possible. They sometimes failed in consequence of the bloodvessels, by which the granulations are supplied, not extending into the true skin, which supports the epidermis and furnishes the material by which cicatrization is accomplished. Ollier, in 1872, applied large portions of the skin, which should receive the name of "cutaneous transplantation." He claims that the cicatrix is like the true skin, and does not contract, and consequently is not followed by the serious and often fatal consequences of an extensive cicatrix resulting from a burn. From the date of Dr. Ollier's case, it is apparent that the credit of the operation he performed belonged to California, as will be substantiated by the following case:

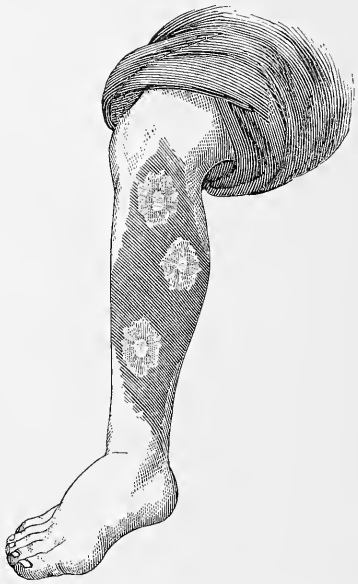
E. Raganisse, aged forty-two years, a native of France, and a laundryman by occupation, was admitted into the County Hospital, September 9th, 1871, with both legs scalded from the knees to the ankles. It was a burn of the second degree; when the skin sloughed two large, deep, and painful ulcers was the result. At the expiration of six weeks they had not perceptibly diminished, and the patient having consented to the operation, it was performed in the presence of the class of the Medical College. A portion of the skin of the right arm, three inches long and half an inch wide, was removed. The true skin was dissected off carefully, so as to remove the subcutaneous cellular tissue, which, after being washed in tepid water, was divided into six equal parts; they were applied three on each leg, as represented by Fig. 76, and secured by the application of adhesive plaster. The ulcer was dressed daily with simple cerate, and on the seventh day the plasters were removed;

the only change that was observed in the grafted portions of the skin was that the cuticle seemed to be detached, and they were a shade lighter in color and smoother than when placed in contact with the ulcerated surface.

Fig. 77 represents the appearance of the ulcers three weeks after

Fig. 76.

Fig. 77.



the operation, and in four months both of the ulcers were entirely healed, and he left the County Hospital.

This method was adopted in consequence of the result of the operation of Reverdin, in this city, being so unsatisfactory, although I was not aware that it was the first that had ever been performed of the same character.

This patient was examined whilst in the County Hospital by the physicians and surgeons of the county, by the members of the class, as well as by Professor Morse, and many of the other physicians of San Francisco.

EPITHELIOMA.

Mary Murry, when placed under my treatment, was suffering from an epitheloma of the lower eyelid. After remaining at St. Mary's Hospital for several weeks without obtaining relief, she applied to a cancer doctor of this city, who applied escharotics so powerful that the periosteum of the malar bone was destroyed, and the bone became carious. There being but one course of treatment

Fig. 78.

indicated, assisted by my nephew, Dr. W. H. Belton, of Colusa, in July, 1865, at the corner of Green and Sansom Streets, I removed the lower lid, chiselled off the diseased bone, and by transplanting a sufficiently large portion of the skin from the side of the forehead supplied the defect. The skin transplanted adhered, the deformity was removed, and she now enjoys good health, is married, and living in this city.

DEFORMITIES OF THE NOSE.

Deformities of the nose which result either from fractures of the nasal bones or laceration and displacement of the cartilage which forms the septum, change the expression of the face more than any other injury, and when accompanied with much swelling, may not be detected until after the fracture has united or the cartilage has formed other attachments which produce deformities that have heretofore been considered incurable. Fig. 79 represents a case of this character occurring in my practice some time since.

Miss P., while endeavoring to light the gas, fell from a chair upon her face, in consequence of being exhausted from loss of sleep during the protracted illness of her mother. Twelve or fifteen hours elapsed before I examined the injured part, and then it was enormously swollen. The nasal bones were not injured, but it was not possible to determine what other injury had been sustained. Two or three days after the occurrence, I lost sight of the case in consequence of the death of the mother and a change of residence. After living two years in New York she returned to San Francisco, about four months since, greatly disfigured on account of the nose being flattened, and the apex turned to the right side. She visited this city with the hope of having an operation performed that would remove the deformity, and in consequence of the great anxiety exhibited, I consented, being confident that the deformity would not be increased.

After having had the instrument represented in the cut made by Messrs. Folkers & Co., the cartilage was detached from the inner side of the nasal bones by a subcutaneous section with an ordinary tenotomy knife, the incision being made inward and slightly downward. A steel-pointed harelip pin was then passed from above the incision through the portion that had been depressed obliquely, and escaped about an inch below the incision. Others were inserted in the centre of the nose—one a few lines above the other—and passed out on the side as previously stated, about half an inch from the extremity of the organ. The apparatus was then applied to assist the pins to overcome the lateral curvature. The pins were removed the tenth day, but finding that the newly formed attachment was not

sufficiently firm and extensive, another pin was passed from the centre of the nose through the cartilage and below the incision about half an inch, and brought out near the centre, but slightly to the

Fig. 79.

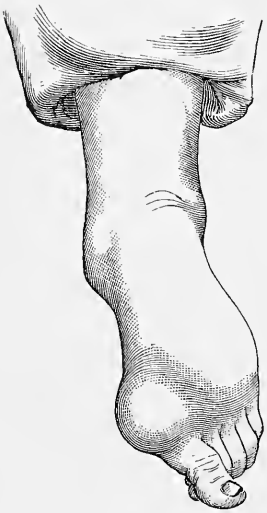
right. This was allowed to remain until considerable inflammation was produced, and when removed, the appearance and firmness of the part indicated that a considerable quantity of lymph had been deposited, and organized, I think, sufficiently to prevent the recurrence of the difficulty. No deformity is now perceptible; the wounds produced by the insertion of the pins have healed, leaving only a very slight cicatrix. She will wear the apparatus at night for several months.

BUNIONS.

A bunion is generally produced by pressure, and the swelling is caused by inflammation of the tissues which cover the metatarso-phalangeal joint of the great toe. The bursa in some cases be-

comes diseased, and a subcutaneous incision with sorbefacients, as recommended by Prof. Gross, often gives relief. Occasionally the bone enlarges so much as to disfigure the foot greatly, without being very painful, but generally the pain is very great, and the ordinary remedies fail to afford relief. For such cases, what should be done? The unfortunate man or woman must either be allowed to suffer from the consequences of the folly of wearing small shoes, or submit to an operation by which they can obtain permanent relief.

Fig. 80.



Excision of the head of the first metatarsal bone for the cure of bunion, is illustrated by three successful cases:

Case I.—A. G., a German, about 35 years of age, entered the hospital in July, 1875, to receive treatment for ulcerated bunions of the metatarso-phalangeal articulations of both feet.

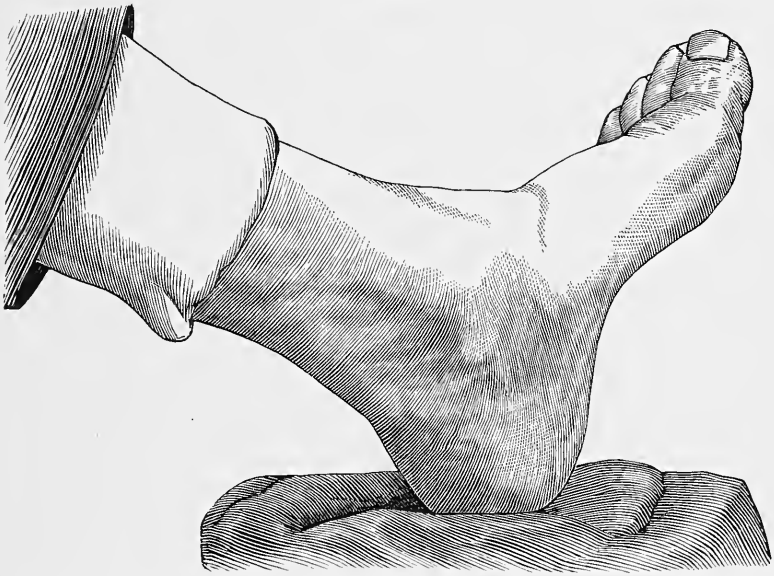
The great toe of each foot was turned outward, and overlapped the second and third toes. The articular surface of the first phalanx was displaced inward, producing a remarkable prominence at the extremity of the metatarsal bone. The pain in walking was so severe as to render locomotion almost impossible.

The ulcers soon healed under the influence of rest and a dressing of simple cerate. Efforts were repeatedly made to bring the toes into their proper places by mechanical means, but without success. It was finally determined to remove the enlarged inner part of the head of the metatarsal bone, which was done in the following manner:

A straight incision an inch and a half in length was made along the inner border of the metatarsal bone, extending from the anterior extremity over the prominence of the bunion to a point about an inch anterior to the posterior extremity of the bone. The tissues were then dissected from the bony projection, care being taken not to open the articulation. The prominence was then removed with

the saw, in a line parallel with the axis of the bone. The sharp edges of the bone were bevelled off with the chisel, and the edges of the incision were brought together and united with several silver sutures. A dressing of simple cerate was then applied. The toe was now easily brought into its natural position, and was kept in place by means of a straight splint, extending along the inner margin of the foot, from the heel to the extremity of the great toe. It was well padded with cotton, and secured to the foot by a bandage, the toe being thus firmly retained in its proper position.

Fig. 81.



Cured bunion.

Both feet were operated upon at the same time in this manner. The wounds healed promptly, after which passive movement of the articulation was kept up in order to prevent anchylosis. The splints were removed after the third week, when it was found that the deformity was entirely relieved, the toe being on a line with the inner margin of the foot. The appearance and function of the feet were in every way as perfect as could have been desired. Over a year

has passed since the operation, and his feet have given him no trouble whatever.

Case II.—A book agent, F. F., aged 46 years, entered the hospital in May, 1876, with an ulcerated bunion of the left foot, of several months' standing. The great toe was displaced inward, and overlapped the second and third toes, as in Case I. The metatarso-phalangeal articulation was much swollen, and the slightest pressure gave great pain. The ulcer was about six lines in diameter, and occupied the prominence of the bunion. In a short time the ulcer healed, leaving a hard tender projection in its stead.

As the patient had previously been subjected to a variety of mechanical appliances without benefit, the case seemed a suitable one for partial excision. In this instance an oval incision was made through the skin on the inner surface of the metatarsal bone, so as to include the indurated tissues over the bunion. The head of the bone was found to be enlarged and also diseased, the cancellous tissue being much softened. The entire head of the bone was removed by carrying the knife through the articulation, severing the lateral ligaments, and dividing the bone with the chain-saw just posterior to the head. The edges of the incision were brought together anteriorly. Posteriorly an opening was left for drainage, as that end of the wound, being dependent, afforded the most ready outlet to the discharge. The toe was brought into proper position, and retained by a splint as in Case I. Slight suppuration followed, but by the sixth week the wound had healed, and the motion of the toe was perfect. A new joint had evidently been formed. The foot differed from its fellow only in being a few lines shorter. In two months after the operation, F. F. resumed his occupation of canvassing, and has since been free from pain or inconvenience.

Case III.—Mrs. B., a lady of 47 years of age, a book canvasser, and accustomed to walking several hours every day, entered the hospital in September, 1876, with an ulcerated bunion of the left foot, which had of late become so painful as to prevent her from pursuing her occupation. She had suffered from the difficulty for many years, and had received every variety of treatment without benefit. In this case excision of the head of the bone was performed as in Case

II, but without waiting until the ulcer had healed. The diseased tissues were included in an elliptical incision, as in the foregoing case.

The result was all that could have been desired. No appreciable deformity exists, and she now walks with more comfort than for years before. She is now on her way to the East, and expresses great dissatisfaction with the result of the treatment heretofore received.

SYPHILIS AND ITS TREATMENT.

LECTURE XLIII.

GENTLEMEN: Formerly lues venerea and morbus venereus were the terms employed to designate the local affections resulting from impure sexual intercourse. The word pox was applied to the various affections of the skin, which appear after it has become constitutional, from their resemblance to the pustules which characterize small-pox.

Syphilis is the term now universally employed to distinguish every variety of this insidious, disgusting, and formidable disease. For this we are indebted to Fracastor, who has represented in his poem, that a shepherd called Syphilus was the first who suffered from, and presented all the symptoms of this affection, being a punishment inflicted upon him by an offended deity. Whether true or false, the name has been retained, and is as convenient as any other that could be employed.

Much difference of opinion exists respecting the origin of the disease and the date of its appearance. Many believe that it is coeval with the human family, and base their opinion upon the unquestionable existence of the affections of the genital organs many centuries before the discovery of America. Hippocrates was familiar with ulcers and cutaneous affections which are now attributed to the influence of that poison. Celsus described many that are at present regarded as venereal, and from his description both simple and indurated chancres might be readily recognized, although he was not ignorant of the existence of phimosis and paraphimosis; to use the language of Vidal, he neither wrote a work upon the subject, gave them a name, nor indicated a specific treatment.

Notwithstanding these affections were accurately described by the ancients, they were regarded as the results of simple inflammation in consequence of their ignorance of a specific cause, and the relation that existed between it and the symptoms.

To William of Salicet we are indebted for a description of a swelling in the groin, resulting from ulcers on the prepuce, and Lanfranc mentions the same difficulty produced by ulcerations of the penis. "*Sæpe provenat apostema in inguine propter ulcere virgæ, propterea quod est descensus humorum ad illa loca.*" This language cannot receive any other interpretation, and it is evident that he attributed the inguinal enlargements to the matter secreted by the ulcers, although the extension of the disease may now be differently and more satisfactorily explained. In Vidal we find, that in consequence of disease resulting from intercourse with the prostitutes of London, certain regulations were adopted before the beginning of the fifteenth century. Although many other well-authenticated facts might be adduced, I consider these sufficient to establish the existence of the disease in Europe many centuries before the discovery of America; but it cannot be denied that about that time it acquired an activity and malignity which was before unknown, and produced not only the greatest consternation, but also directed the attention of physicians especially to the subject. All the symptoms were then carefully observed, the varieties accurately described, and a methodical and specific treatment recommended, which accounts satisfactorily for a majority of medical writers having agreed upon the fifteenth century as the date of its origin. If no evidence existed of its prevalence previous to that period, the conclusion that it was an evil imposed upon civilization by the savages of a distant country, who were themselves at that time ignorant of the disease, was not only gratifying to their pride, but also a very plausible excuse for their ignorance of the peculiarities of a disease with which they should have been familiar. If the acquisition and spread of syphilis was a necessary consequence of the most brilliant discovery that was ever achieved, both in its conception and accomplishment, it would have been better if the continent of America had remained in the possession of wild beasts and savages, and that civilization had not extended beyond the eastern coast of the Atlantic.

In 1495, when Naples was occupied by the French army, under the command of Charles VIII, it spread with such alarming rapid-

ity, and produced such extensive ravages, that it received the name of the epidemic of the fifteenth century. In 1492, Columbus sailed from Spain, and returned in 1493, and, if the malady had been contracted by his crew on the islands discovered, it would have been impossible (admitting that they returned with the primary and contagious form of the disease, and that the inhabitants of Europe indulged in the most indiscriminate illicit intercourse) for it to have spread so rapidly as to become a fearful epidemic in so short a period. To Fallopius we are indebted for the first correct and accurate description of the disease, although Fernel deservedly occupies the front rank amongst the scientific writers upon the subject; he described both the local and constitutional symptoms so faithfully and accurately, that but little has been added during the last two centuries.

For twenty years the primary symptoms engaged the attention of the profession almost exclusively, and it was not until the year 1516 that Juan de Vigo described what is now considered the tertiary form of the disease; Maynard directed the attention of the profession to warts and excrescences upon the vulva and penis in 1530; Fracastor to inguinal bubo in 1533; Brassavole and Filippe added alopecia to the symptoms already known, in 1551, and about the same time engorgements of the lymphatic glands, resulting from infiltration of serum, ringing in the ears, ophthalmia, nocturnal pains, and a variety of other symptoms were added.

When the venereal virus is applied to a mucous membrane, to a part deprived of its cuticle, or sometimes to the healthy skin, either a redness, excoriations, chancre, or, as some suppose, mucous pustules, are produced. The latter, though generally regarded as a primary affection, I have always considered as resulting either from the irritation of a gonorrhœal discharge, or a constitutional affection, and then they are easily distinguished from what is usually considered a simple mucous pustule. A disease of this character prevails extensively amongst the negroes of the South, in which the scrotum, labia, and thighs are covered with pustules of this character, from which a profuse and peculiarly offensive secretion is produced. It is contagious, never becomes constitutional, and yields readily to local treatment. This is usually called Norfolk itch—most probably from its prevalence in that locality.

A chancre is a small ulcer produced as above specified, and has

received the appellation because it is frequently painful, and extends like a cancerous ulceration. This definition, however, is not strictly true, as many of them are both indolent and stationary. They are either primitive or consecutive,—primitive when they appear very soon after the application of the poison, and consecutive when they reappear after several weeks have elapsed. Primitive chancres are located at the point where the virus has been applied; the period of their development is somewhat uncertain, varying from twelve hours to seven or eight days.

Consecutive chancres are always produced at a considerable distance from the point occupied by the primary ulcer, and are not developed in less than forty days after the disease is contracted. They are generally situated upon the mucous membranes near the external surface of the body, as upon the glans penis and prepuce in the male, and upon the external surface of the labia, the clitoris, or entrance of the vagina in the female. They are, however, often seen upon the eyelids, lips, mammæ, under the arms, on the perineum, scrotum, fingers, and toes, and indeed wherever the skin is not usually very dry.

I have seen in the United States Marine Hospital, in San Francisco, an ulcer upon the upper eyelid, which presented all the characteristics of a genuine Hunterian chancre. Another, equally well marked, was seen near the root of the nail of the right index finger; both of these had resisted the ordinary remedies, and were followed by secondary symptoms, but yielded readily to mercurial treatment. Chancres upon the lips, nose, and mammæ are so common that every physician engaged in practice must have met with cases so decided in their character that they could not be mistaken. Chancres at the commencement present small, red, and elevated points, which are usually accompanied with an inconvenient pruritus. The centre becomes rapidly elevated, whitish, vesicular, and transparent, and emits a reddish and acrid serosity; very soon the summit of the elevation disappears, and an excavation is manifest. The edges, from the loss of substance resulting from the progressive ulceration, become elevated, frequently indurated, and the ulcerated surface secretes a fetid and more or less abundant purulent matter. In other cases, from the activity of the poison, the affected part becomes deeply ulcerated before the patient is conscious of the existence of any serious derangement.

Sometimes chancres present the appearance of a simple excoriation,

which gradually extends until it presents all the peculiarities of syphilitic ulcers.

Frequently, in California, in a few days after exposure, both the glans penis and inner surface of the prepuce exhibit a continuous excoriated surface, with a few points of ulceration. This form of the disease is most commonly observed after intercourse with the Chinese prostitutes, who are so numerous in this city, and who seem to have modified the disease very materially, as an ordinary chancre seldom results from such exposure.

In other cases the skin covering the penis, most commonly posterior to the glans, inflames and becomes painful, suppuration takes place in the subcutaneous cellular tissue, and when the integument either ulcerates or an incision is made for the evacuation of the pus, it speedily assumes all the peculiarities of a genuine chancre. Sometimes these exist alone, and occasionally chancres appear simultaneously upon the prepuce and glans penis. The surface of a syphilitic ulcer generally presents a grayish-white color. The edges are more or less perpendicular, elevated, and surrounded by a reddish margin. Chancres of this character are usually followed by buboes, which depends either on the inflammation extending to the neighboring lymphatic glands or upon the absorption of the virus.

Chancres differ in character, are accompanied by a greater or less degree of inflammation, and, consequently, are divided into mild or indolent, painful or inflammatory. Some primitive and almost all consecutive chancres are indolent, although a majority of the former are decidedly inflammatory, and are frequently accompanied either with phimosis or paraphimosis.

The progress of chancres is as different as their character, and they are divided into stationary, phagedenic, and serpiginous.

The varieties in shape or form which they present are not less decided; generally they are round or oval, although many irregularities are observed, and the character of an ulcer upon the genital organs cannot always be determined, either by its shape or appearance, as many aggravated constitutional symptoms frequently result from ulcers that heal readily and present none of the characteristics of a Hunterian character.

Treatment.—I will next present for your consideration the means which have been found to exert a controlling influence over the primary manifestations of this rebellious disease.

When an ulcer presents the appearance which I have just described to you, and succeeds a suspicious connection, and even when apparently a simple ulcer results under such circumstances, it should be regarded as syphilitic, as no injury can possibly result from a properly regulated mercurial course being continued until its character can be positively determined, and much inconvenience and suffering might be inflicted if a different course were adopted.

In order that you may not misconstrue the foregoing remarks in reference to doubtful ulcerations, I will mention that those resulting from herpes preputialis are not included, as they are easily distinguished from every variety of chancre, and in such cases no necessity exists for specific treatment, although hundreds are treated as syphilitic, and the constitution of the patients destroyed by repeated mercurial courses, rendered necessary, as is supposed, by the return of the disease. Herpetic vesicles generally appear in clusters; when the serum escapes a scab forms upon each, and if proper attention to cleanliness is observed, they disappear, to return with the cause by which they were originally produced. They frequently result from irritation of the urethra, although they often occur without the existence of any appreciable cause. The application of nitric acid or Monsel's salt promptly effects their cure.

The local treatment of chancre should vary with the character of the disease and its complications.

Simple Chancres.—In the simple venereal ulcer, a great many remedies are recommended. Some prefer mild and unirritating substances, such as a decoction of marshmallow and flaxseed; others prefer simple cerate, aquæ calcis, or Van Swieten's liquor, more or less diluted with vinum opii compositum. When the sore becomes indolent, nitrate of silver or sulphate of copper is considered necessary. The abortive treatment is sometimes preferred, which consists in the application of nitrate of silver as soon as the chancre is discovered, for the purpose of preventing the absorption of the virus, and thereby removing the necessity of constitutional treatment. Lagneau is decidedly opposed to this proceeding, because it increases the liability of the formation of bubo, and frequently induces the patient to discontinue the specific treatment before the virus is eradicated from the system.

Inflammatory Chancres.—General and local abstraction of blood, rest, laxatives, and low diet are recommended. In some cases, every

method of treatment fails, and gangrene supervenes, produced by the distension of the part, necessarily resulting from excessive inflammation. In California, sloughing chancres are very common, and can usually be traced to the injudicious application of local irritants, to inattention to cleanliness, or to intemperance. During the two years that I had charge of the United States Marine Hospital, many cases of this description were treated in that institution. Special attention should be paid to the constitutional derangement which generally accompanies this form of the disease. The local application which I have found most effectual in arresting the progress of the disease is nitric acid. In order that the application may have the best possible effects, there are a few details to which I will now direct your attention. It should be applied to the diseased surface by means of a small, soft stick of wood, which should be dipped into the acid and then brought into contact with the ulcerated surfaces. In a minute the surplus acid should be washed off, either with a strong solution of the supercarbonate of soda or by means of a small stream of water from a faucet to which a piece of rubber tubing may be attached, thus rendering the stream more manageable. A dressing should then be applied, consisting of simple cerate spread upon a piece of lint just large enough to cover the ulcerated surface. The prepuce should then be brought over the glans penis.

A constitutional course of treatment is never necessary in cases of phagedenic chancres, as the sphacelation appears to destroy, or at least to prevent, the absorption of the virus. Malignant chancres, which are painful and not violently inflamed, are either phagedenic or serpiginous. The first extend rapidly in depth and circumference, and cause extensive destruction both of the skin and subcutaneous cellular tissue. Serpiginous chancres are much less dangerous, and heal on one side whilst they extend on the other. They are known by their hard, elevated, and bleeding edges, have ash-colored surfaces, and are covered with eschars. In phagedenic and serpiginous chancres, you will find the local application of nitric acid the most reliable remedy—one application being frequently sufficient to arrest the progress of the disease and change the character of a rapidly spreading or obstinate chancre into a healthy, granulating surface. Should you, after two or three applications of the nitric acid, find that there is a tendency to hæmorrhage, or that healthy granulations do not promptly appear, then the best application to make is the powdered

subsulphate of iron or Monsel's salt. This drug not only checks the bleeding in phagedenic chancres, which is sometimes severe, but it also exerts a most salutary influence upon the ulcer, promoting rapid cicatrization, and, at the same time, acting as a powerful sorbefacient by reducing the swelling, which is so often an annoying complication in this form of the disease. Before the salt is applied, the crystals should be broken, which can be accomplished by introducing a small, dry spatula into the bottle, and revolving it until the necessary diminution is effected. The bottles containing it should be small, in consequence of its great deliquescence, and the air should be carefully excluded. It should be applied freely once every twenty-four hours, in cases where its effects are desired, for unless carefully and properly used, you may fail to obtain the favorable results which I have so often witnessed.

LECTURE XLIV.

CONSTITUTIONAL TREATMENT OF PRIMARY SYPHILIS.

GENTLEMEN: In the last lecture I described to you the method of detecting the initial lesion of syphilis, together with the plan of treatment which I have found most efficacious in the management of the local derangement. It now remains for me to present to you the internal or constitutional remedies, which you will find to be a most important adjuvant to the local treatment.

Before, and even many years after, the work of the celebrated John Hunter appeared upon this disease, in 1786, many physicians not only denied the existence of a specific poison, but also contended that neither chancres nor any of the varieties of syphilitic ulcers required a different treatment from that usually employed to control either simple inflammation, irritation, or ulceration upon other portions of the body. The fact that Rose, G. J. Guthrie, Fergusson, Hennen, and McGregor, distinguished surgeons of the British army, as well as Hill, Bartlett, and Turner, of Edinburgh, and Carmichael, of Dublin, advocated this doctrine, is very astonishing, and can only be attributed to a want of sufficient experience to enable them to determine the comparative efficacy of the various methods of treatment that were then employed.

Notwithstanding the influence necessarily exerted by such high authority, the doctrine they advocated, not being sustained by experience, was neither so popular, nor the anti-mercurial treatment so strongly supported, nor so generally adopted in England, as it was subsequently in France. In 1697, Sinapicis announced that there was no such disease as syphilis, and he was sustained by some of the most celebrated members of the faculty. Jourdan, Richard, Deverrais, Lefevre, and Dubled contended that all inflammations were not only identical in their character, but also that their peculiarities depended entirely upon the tissues in which they were developed, or upon their greater or less intensity, and not upon the specific irritation by which they were produced.

A distinguished professor of Montpellier, in order to determine positively by experiment the curability of chancre without the use of mercury, selected a hundred recent cases, with the following results: The local symptoms disappeared in ninety by the employment of the ordinary antiphlogistic treatment. Only ten cases, in which the secondary symptoms appeared soon after the primary ulcers healed, were relieved, and in them, when the disease assumed the tertiary form, although subjected to the same treatment, it was successful apparently only in three, even in the first stage, and was entirely inefficacious after the system became thoroughly saturated with the poison.

Although the result of these experiments was of the most positive character, a long period elapsed before the mercurial treatment was generally adopted, even by scientific physicians. This depended upon the abuse of the remedy, and its administration being generally accompanied by purgatives and low diet, by which the system was so much enfeebled that the disease progressed with greater rapidity than when entirely neglected. The symptoms resulting from the progress of the disease were very improperly attributed to the poisonous properties of the remedy. Even as late as 1833, many physicians in Paris were unwilling to admit either the existence of a specific poison or the superiority of the mercurial treatment; but now no difference exists between the respectable and worthy members of the profession, consequently the relative value of the different mercurial preparations remains only to be determined.

It is generally admitted that crude mercury, when administered internally, is comparatively inert by reason of its insolubility, and in order to render it active, it becomes necessary to subject it to trituration, calcination, or the action of acids. Boerhaave, of Leyden, and Saunders reduced it to a powder by agitation, and administered it in that form, which, although sufficiently active, requires so much time and labor for its accomplishment that other preparations are generally preferred.

When crude mercury is triturated for a long time with unctuous substances, the metal is changed, and a very convenient and active preparation is the result, which, when applied externally, produces the constitutional effect of the remedy as speedily as it can, with entire safety, be accomplished.

If combined in the same manner with either gums, mucilages, or

saccharine substances, a very valuable internal remedy is obtained, which was formerly more extensively employed than any of the other numerous preparations of the mineral. The use of the pilulæ hydrargyri is not restricted to the treatment of this disease, but is prescribed whenever it is necessary to administer a mild laxative and mercurial alterative.

The proto and deutochlorides of mercury are produced by the combination of this metal with muriatic acid, and the proto and deutiodides by uniting it with iodine; the latter are now considered among the most valuable of all the mercurial preparations in the treatment of primary syphilis. Mercury may be administered either internally or externally, and externally either by fumigation or friction.

When a syphilitic ulcer progresses with such rapidity as to defy the action of the ordinary remedies, particularly when situated upon an important portion of the body, the loss of which would produce either permanent deformity or impotency, fumigation should be employed. The most simple and convenient method of obtaining the full effect of the remedy by this method of administration, is by throwing cinnabar or Ethiops mineral upon burning charcoal in a close room, and exposing the surface of the body to the action of the fumes whilst they are being inhaled. Should their inhalation embarrass respiration seriously, the patient may be allowed to breathe pure air, and the action of the remedy be confined to the external surface.

A patient, even if the symptoms be urgent, should not be exposed to mercurial fumigation more than half an hour morning and evening, as salivation is frequently very speedily produced, and if injudiciously employed, the effect is sometimes very alarming. The action of this remedy being transient, nothing more should be expected from it than to arrest the progress of the disease until other more safe and manageable preparations have time to exert their influence. In 1736, Charbonnier appeared in Paris, and professed to cure every variety of the disease by fumigation, administered so as to be not only safe, but also easily controlled. The expectations excited by this announcement not being fully realized by the profession, it was abandoned until 1776, when Laborrette published that he had discovered a new method of employing fumigation, which was universally applicable. Abernethy adopted his treatment in some cases,

and was satisfied with the result. As time determines the value of every remedy, this is now only resorted to in obstinate and malignant syphilitic affections, in consequence of the difficulty experienced in controlling its action. Bell thinks that great benefit may be derived in obstinate syphilitic ulcers by the local effect of fumigation, as they frequently assume a healthy appearance and cicatrize rapidly after resisting the influence of other treatment.

The red oxide of mercury was a favorite remedy of Hunter, which, although very efficacious, is now rarely prescribed in consequence of the expense and difficulty attending its preparation.

Bell, the author of one of the best works published during the last century, preferred the endermic application of mercury, and thought that in general practice it should be preferred. From one to two drachms of the unguentum hydrargyri may be employed daily, and thirty minutes should be consumed in making the application. He was induced to adopt this method of treatment in consequence of the effect of all mercurial preparations, when taken internally and long continued, upon the stomach and bowels.

Marjolin, who was one of the ablest professors of surgery in the school of medicine in Paris, advocated in the strongest terms this treatment in primary syphilis, because he believed it to be superior to any that could be adopted. He stated in his lectures that he had observed carefully the result of every course of treatment that had until that time been recommended, and was convinced that the endermic application of the unguentum hydrargyri was the most certain and expeditious method of not only removing the local affection, but also of securing the patient against constitutional symptoms.

Lagneau, the most distinguished writer upon syphilis at that time in France, pursued the same course of treatment which was recommended and so ably supported by Marjolin. From the authorities which I have just quoted, as well as from my own experience of this treatment, I am convinced that it is now undeservedly neglected, which results both from the inconvenience of its application and the great anxiety of professional men to avail themselves of new remedies, to the abandonment of those of long-established and merited reputation.

Internal Remedies.—Although formerly very numerous, the internal remedies used in this disease have not, all of them, stood the test of experience. Bell, Pearson, and Ricord, many years ago, pre-

ferred the pilulæ hydrargyri to any other preparation, because, administered in this form, the mercury produced less derangement of the stomach and bowels than many of its more active compounds. It may be given in four-grain doses, three times daily, and should the bowels become too active during its administration, it may be combined with a sufficient quantity of opium to obviate that effect, which renders it not only a very safe and manageable but also an exceedingly valuable preparation, in both primary and secondary affections.

The protochloride of mercury is now not much used in England, France, or the United States, although when carefully prescribed, the specific effect of the mercurial preparation may be both readily and safely obtained. It is, however, decidedly purgative, and produces ptyalism more speedily than any other internal remedy, which is a very grave objection, particularly since it has been positively ascertained that the specific action of mercury upon the salivary glands is not necessary to obtain its constitutional effect.

The deutochloride of mercury, although discovered by Basil Valentine, was brought into general use by Van Swieten, and is still prescribed and highly appreciated in every portion of Europe, as well as in the United States. Being easily disguised and not likely to salivate, it is supposed to form the basis of all the quack remedies now employed. Dupuytren preferred this preparation, although it is generally conceded to be more valuable in the tertiary than in the primary stage of the disease. Dr. Locher cured nearly five thousand cases in the Vienna Hospital from 1754 to 1762 with this preparation without salivating a single patient, and during the present century it was preferred and employed by both Drs. Hosack and Francis of our own country. It may be given in doses of one-sixth of a grain, three times daily, either in pill or solution, with or without opium, as may be necessary.

Having carefully observed the effect of the mercurial preparations now employed in the treatment of primary syphilis, and having experimented extensively with the view of determining their comparative efficacy, whilst connected with the public institutions of this city, I am convinced that Ricord's favorite remedy, the protiodide of mercury, is preferable to any other preparation, and that the length of time it is administered is of more consequence than the quantity prescribed. I usually give it in such doses as produce little or no

derangement of the stomach or irritation of the bowels, and continue it sufficiently long to prevent the possibility of the occurrence of secondary symptoms.

Dupuytren recommended the mercurial treatment to be continued as long as found necessary to cure the primary ulcers. Some think twenty or thirty days sufficient to eradicate the virus; but I am satisfied that in aggravated cases it should be continued two months at least, and should this course be adopted, our public hospitals would not be crowded with patients suffering from every variety of constitutional syphilis.

The following formula, I have found both efficacious and manageable:

℞.—Hydrargyri protiodidi, ... grs. xx.
Gum. opii, ... grs. x.
Extracti cicutæ, ... grs. xl.
M. Ft. pilulæ No. xl.

One of these should be taken three times a day. The chancre, by the aid of the local treatment which I described to you in the previous lecture, generally disappears rapidly, without any other sensible effect being produced. Occasionally sickness of the stomach, loss of appetite, and irritation of the bowels occur, and then pil. hydrargyri combined with opium and cicuta should be substituted. If, however, the internal administration of mercury proves obnoxious to the patient, it should be applied endermically, and accompanied with the decoction of sarsaparilla, guaiac, and sassafras, for the purpose of increasing the activity of the digestive organs, and thereby improving the tone and vigor of the general system.

In scrofulous subjects, even in the primary form of the disease, the deutochloride of mercury should be preferred, in combination with the iodide of potassium, to counteract the strumous tendency, which is always increased by the long-continued use of a remedy so decidedly debilitating as are even the mildest preparations of mercury.

The following combination, I have found to be not only efficacious, but greatly superior to any other that has been employed:

℞.—Hydrargyri chloridi corrosivi, . . . gr. j.
Potassii iodidi, ... ʒiv to ʒv.
Tincturæ aconiti radicis, ... ʒiss.
Extracti stillingiæ sylvaticæ,
Syrupi sarsæ compositi, āā . . . . ℥iiss.
M. Sig.—Take one teaspoonful, three times a day in water.

The solution of iodide of potassium in the mixture being in excess, after the necessary chemical changes occur, biniodide of mercury in a solution of iodide of potassium is produced. The syrup of sarsaparilla is only used to disguise the other ingredients, and the extract of stillingia is used in consequence of its antisyphilitic and antistrumous properties. In the Southern Atlantic States it is extensively used in such cases, and by many is relied upon exclusively in their treatment. To Robert Y. Simmons, of Charleston, South Carolina, is due the credit of directing the attention of the profession to this very useful article. The extract of stillingia, being unpleasant to the taste, sometimes produces sickness of the stomach and even vomiting, which renders it necessary that it should be discontinued, it being very important to give special attention to the digestive organs, for upon their activity, in many cases, depends the safety of the patient. During the use of this or of any other preparation containing mercury, so soon as evidences of general debility become manifest, it should be either suspended or continued in minute doses, in combination with tonics, either vegetable or mineral.

Notwithstanding the opinion recently advanced and apparently sustained by those worthy of confidence, that simple chancres are never followed by constitutional symptoms, a mercurial course should invariably be prescribed, the necessity of which will be more fully demonstrated when we come to the treatment of secondary affections. I have repeatedly seen a simple chancre that was healed in a few days by mild local applications, followed by the most serious constitutional symptoms. Moreover, I am perfectly satisfied that they are more dangerous than those of a malignant character, as the treatment is not adopted by which alone the system can be protected. A professional friend in this city, some time ago, treated a case of inflammatory indurated chancre, communicated by a patient under his care, with apparently a simple ulcer, and who assured him that he had never before had any form of venereal disease.

I have also repeatedly met with patients in the United States Marine Hospital in San Francisco, with secondary syphilis, who presented evidences of having previously suffered seriously from the same form of disease.

That ulcers frequently appear upon the genital organs, yield to simple treatment, and are not followed by any constitutional affection, cannot be denied. In such cases, it is more than probable that

they are not produced by impure intercourse, and result from simple irritation, which would produce a similar difficulty upon any other portion of the body. Although I have observed the ulcers that appear upon the genital organs closely, watched their progress daily, and have endeavored to familiarize myself with their aspect and peculiarities, yet I must confess that in some cases I cannot determine positively their true character. Therefore, when doubt exists, I have always prescribed a mercurial course, to secure the patient from the consequences of this most obstinate, complicated, and unmanageable disease.

Although the greatest care is taken in the administration of mercury, even in its mildest forms, when an extraordinary susceptibility to its action exists excessive salivation is sometimes produced, which is much more troublesome during its continuance than the disease for which the drug was prescribed.

A great variety of remedies have been recommended to counteract the specific action of mercury upon the mouth and salivary glands. Sulphur was formerly regarded as a specific, although it is now but seldom administered, having yielded to the iodide of potassium, which is preferred because it combines with the metal and facilitates its elimination from the system. Although valuable, this preparation is inferior to the chlorate of potassium as a general remedy, ℥ij of which should be suspended in four ounces of simple syrup, and administered in dessertspoonful doses every two hours during the day. This, with the application of nitrate of silver to the ulcers, will be found to remove ptyalism more speedily than any other treatment. When the secretion of saliva is profuse, it may be temporarily arrested by any of the preparations of opium, which should be administered at night.

As soon as ptyalism begins to subside, the deutochloride of mercury should be preferred to any other preparation, and by combining it with the iodide of potassium, it may be given sufficiently long to eradicate the virus without subjecting the patient to a recurrence of the disease. After the subsidence of the febrile symptoms in the inflammatory form of primary syphilis, mercurials should be prescribed, and a generous diet allowed, to counteract the debilitating effect of the remedy. Milk is the only article in common use that should be prohibited, as it does unquestionably counteract the specific action of all the mercurial preparations.

LECTURE XLV.

BUBO.

GENTLEMEN: Syphilitic bubo is a painful swelling or tumor resulting from an enlargement of a lymphatic ganglion, either of the groin, neck, or armpit, produced by the absorption of the venereal virus.

Nicholas Massa designated it, in 1532, "aposthema inguinum," and Marcel de Como, the first writer upon this disease, not only describes bubo with sufficient accuracy, but also attributes it to the proper cause—"Ego Marcellus Comanus infinitos bubones causatos ex pustulis virgæ curavi."

Syphilitic bubo is either primitive, consecutive, or constitutional. Primitive bubo appears without being preceded by a chancre, and begins to develop from the third to the sixth day. That the venereal virus is capable of being absorbed, and affects the ganglia without producing either irritation or ulceration at the point of application, was long denied by many whose opinion upon any subject was worthy of the greatest confidence. Careful observation has, however, determined this question positively. I have repeatedly seen buboes appear without being preceded by the slightest abrasion of either the skin or mucous membrane, that when treated as simple ganglionic enlargements were followed in a few weeks by secondary symptoms.

Consecutive bubo always manifests itself some time after the appearance of the primary affection, and is generally located in the immediate vicinity of the ulcer by which it was produced. Sometimes the irritation extends from the chancre up the side of the penis to the nearest ganglion, which accounts for a bubo being developed near the pubis. It seldom appears before the eighth or tenth day, and frequently not until the chancre heals, and the patient considers himself entirely cured.

Constitutional bubo is produced by consecutive ulceration.

Buboes are divided into inflammatory and indolent. The first are very painful, and progress rapidly either to resolution or to suppuration. The second are neither painful nor accompanied with discoloration of the skin, suppurate rarely and with difficulty, and are either constitutional or complicated with scrofula, when they frequently acquire an enormous size, and are exceedingly obstinate.

Inflammatory buboes are generally located upon the same side upon which the chancre appeared, and are usually indicative of a recent affection.

When above Poupart's ligament and in the groin, they are called inguinal; when below Poupart's ligament, crural; and when near the pubis they receive the appellation of pubic.

Although they are easily distinguished from other tumors, mistakes of a very serious character have frequently occurred, which can only result either from great carelessness or excessive ignorance. To the touch they differ from strangulated inguinal or crural hernia both in form and consistence, and are not accompanied by the constitutional symptoms, such as obstinate vomiting, small, rapid pulse, and excessive prostration, inseparable from a protracted constriction of even the smallest portion of the intestinal canal. They may be easily distinguished from sympathetic bubo or scrofulous enlargement of the lymphatic ganglions, by the history of the case and the progress of their development. He who mistakes a bubo, either inguinal, crural, or pubic, for any other tumor that may appear in that region, is unworthy of the title he has assumed, and deserves the consequences that must inevitably follow a false diagnosis.

Sometimes only a single ganglion is affected, the first to which the virus is applied; more frequently, however, several are implicated, and either become indolent, or progress regularly and rapidly to suppuration.

Treatment.—Bubo requires the same constitutional treatment recommended for primary syphilis, and it is equally, or more important to sustain the vigor of the system, in consequence of the tendency to the development of obstinate phagedenic ulcers after the purulent secretion has been discharged. In combination with a mild mercurial course, the compound decoction of sarsaparilla, before recommended, or other tonics, should be administered. The oleum jecoris aselli is frequently recommended, but it never should be administered. In such cases give cream, the compound decoction of sarsa-

parilla, with either brandy, whisky, port wine, or Holland gin. Much depends upon the judgment of the physician in such cases. The object in every case should be to obtain a speedy and permanent recovery, which cannot occur should the general health be impaired.

Local Treatment.—When the ganglia in the vicinity of a chancre begin to enlarge, an effort should be made to prevent suppuration, and for that purpose the best local application is a solution of equal parts of tincture of iodine and tincture of arnica. With this the enlargement should be painted morning and evening, and continued until considerable irritation of the skin is produced. Even if suppuration should occur, in consequence of the progress of the disease being partially controlled, a very limited, instead of extensive, abscess will result, and a much shorter period will be required for its cicatrization. Mercurial ointment is preferred by some, although I consider it greatly inferior to the application which I have recommended.

When the ganglia are greatly enlarged, and become indolent, Birt's blistering fluid is the best counterirritant that can be employed, and should be used as often as the irritation subsides. By the application of this remedy the engorgement will either disappear or suppuration occur, which is preferable to the continuance of the engorgement. In these cases, pressure made by the application of a truss has been highly recommended, although in my hands it has been much less efficacious than the application which I before described.

As soon as fluctuation is manifested a bubo should be opened, for if neglected until the parietes become greatly attenuated, before an incision is made they either slough or are destroyed by subsequent ulceration, and an extensive suppurating surface results, which may require many months to cicatrize. When the contents have escaped a tent should be introduced to prevent union by the first intention, which is very likely to occur if the skin has not been partially destroyed by the process of absorption.

After a bubo has been opened the water-dressing is preferable to any other, and it may be continued until the cavity is filled with granulations; then simple cerate should be substituted to facilitate cicatrization. When a bubo has been neglected until the integument ulcerates, and the opening is large, it should be filled with Monsel's salt every day, not only that it may heal rapidly, but also to prevent

the extension of the ulcer, which frequently occurs under the ordinary treatment, and proves both obstinate and exceedingly troublesome. Phagedenic ulcerations of the groin resulting from this cause, particularly when the general health is either impaired when the disease is contracted, or is rendered so by the treatment to which the patient has been subjected, frequently progress rapidly, become excessively irritable, with elevated and indurated edges, and are then the most obstinate and unmanageable of all the varieties of syphilitic ulcerations, and frequently require, even when subjected to the best-directed efforts of the physician with the means heretofore employed, months and even years before their progress can be arrested.

The constitutional treatment should depend upon the previous management of the case and the general health of the patient. If mercurials have been prescribed, and no other evidence of secondary symptoms presents itself, particularly if the system be debilitated, we should rely upon tonics, narcotics, and stimulants, with generous diet. But if no constitutional treatment has been adopted, the deutochloride of mercury, in connection with opium, and iodide of potassium with tonics, should be prescribed, and continued sufficiently long to eradicate the virus. In phagedenic ulceration a great variety of local remedies have been recommended, none of which, however, seem to exert their accustomed influence, and their comparative value can only be determined by experiment. In order to illustrate more fully the foregoing remarks, I will give you the histories of a few cases of this description which have been under my observation.

Case I.—A patient, aged 25 years, and in good health, contracted syphilis in Sonora, in 1850. Under the treatment prescribed the chancres healed, but the ulceration in the groin extended so rapidly that he became alarmed, and was treated both in Sacramento and San Francisco, until the winter of 1853, without obtaining relief. When my attention was directed to the case the ulcer extended from Poupart's ligament on the left side, nearly to the umbilicus, and its transverse diameter was four or five inches. He was then suffering, not only from an extensive phagedenic ulcer, but also from enfeebled health, produced by the debilitating influence of the long-continued use of mercurials. Iodide of potassium, with the compound decoction of sarsaparilla, and a generous diet, were prescribed; the indurated and irregular edges of the ulcer were removed, and its character

changed, by the application of zinc paste. Under the influence of chloroform the paste was applied so as to include about three inches of the margin, and repeated as soon as he recovered from the constitutional disturbance necessarily produced by so powerful an escharotic. This course of treatment, both general and local, was continued twelve months, when the ulcer was completely cicatrized. Four years elapsed from the time the disease was contracted before a cure was effected, which was much longer than was necessary under a different treatment to accomplish that object in cases equally aggravated.

Case II.—In 1854, a patient was readmitted into the United States Marine Hospital in San Francisco, with a phagedenic ulcer that extended from below the anus on the left side, to the anterior superior spinous process of the ilium. The scrotum was so extensively destroyed that the testicles were exposed, and he was so much emaciated by a dysenteric affection that he was unable to walk; which most probably was the result of the injudicious administration of mercury.

He presented evidences of having suffered greatly from its specific action on the mouth and salivary glands. A pill composed of aloes, extract of nux vomica, and opium, each one grain, was given four times daily, with a pint of porter and nutritious diet. As soon as the intestinal irritation subsided, the pills were discontinued and the compound decoction of sarsaparilla substituted. When the general health was sufficiently improved, the ulcer was treated as in the preceding case, with the exception that the Vienna paste was substituted for the zinc paste, the escharotic being allowed to remain upon the surface to which it was applied about fifteen minutes, which is sufficiently long to produce the desired effect. Under the influence of this treatment his general health improved rapidly, and the ulcer healed; he left the hospital in good health, in seven months from the date of his admission, and has had no return of any constitutional syphilitic affection.

This patient was treated several months in the same institution by my predecessor, without obtaining relief, and would never have been cured if he had been subjected to a specific treatment. Whenever a phagedenic ulcer results from a bubo that was treated with mercurials and has existed for a long period without being accom-

panied with any of the symptoms of either secondary or tertiary syphilis, mercury should not be prescribed, as the specific character of the disease has disappeared, and if such treatment be adopted, it will counteract the effect of the general remedies indicated in such cases. If phagedenic ulcers in scrofulous, intemperate, scorbutic, or debilitated subjects are treated as syphilitic, although they were originally produced by that virus, they cannot be cured.

Case III.—In August, 1858, a patient, aged 30 years, and of good constitution, who had been treated two years and a half, visited San Francisco with four phagedenic ulcers, extending from the external insertion of Poupart's ligament to the perineum, connected the entire distance by sinuses, which furnished an abundant purulent secretion. The iodide of potassium with the compound decoction of sarsaparilla were prescribed as an alterative and tonic, and were indicated by his debilitated condition. Monsel's salt was applied daily to the ulcers, and every second day the undiluted tincture of iodine was thrown into the sinuses.

The local affection disappeared rapidly under this treatment; his general health was greatly improved, and in four months he was entirely relieved, except from the slight inconvenience produced by the occasional appearance of a small abscess, which resulted from the excessively vascular condition of the parts originally involved.

Case IV.—In October, 1858, a patient, aged 25 years, of delicate constitution, visited San Francisco with an extensive phagedenic ulcer of the groin, and an inflammatory ulcer involving the entire glans penis. One ulcer extended from the anterior superior spinous process of the ilium to the pubes, and the other was situated upon the thigh below Poupart's ligament, and was less extensive. They both presented all the peculiarities of phagedenic ulceration, were very painful, and extending rapidly. As this patient had not been subjected to a specific treatment, the deutochloride of mercury and iodide of potassium were administered in the combination which I have given you in a previous lecture. The compound decoction of sarsaparilla was administered in conjunction with the specifics. Monsel's salt was applied daily, both to the chancre and to the entire surface of the ulcers in the groin. The former healed in a few days, and the latter were completely cicatrized in eight weeks,

which with the ordinary treatment would have required as many months.

It is difficult to determine the modus operandi of Monsel's salt in such cases. Its action is certainly both prompt and extraordinary. The surface of the ulcer soon presents a more healthy appearance, the irregularity of the edges disappears speedily. The swelling and redness of the surrounding skin subsides, the size of the ulcer diminishes daily, and when closed a smooth cicatrix remains.

This local treatment, although at first painful, is much less distressing than the application of either Vienna paste or zinc paste, nitric acid, or even nitrate of silver, provided it be as long continued. I have not found it necessary to administer chloroform, which is indispensable when the more powerful escharotics are employed, the pain resulting from their application to an irritable ulcer being insupportable without the aid of anæsthetics, the administration of which, even by the most experienced, is sufficiently dangerous to render it necessary to exercise great caution, even in subjects where their use is not contraindicated. Chloroform, when administered rapidly, is much less dangerous than when given slowly, since then the quantity absorbed into the blood not only protracts the effect but increases the danger. Atmospheric air should be inhaled freely with the chloroform, and the room should be well ventilated, so that the effect will not increase after it is considered necessary to withdraw it from the patient. A pair of dressing-forceps should always be placed near the operator, so that the tongue may be drawn forward, and suffocation, when threatened, be prevented. With the same constitutional treatment, I am satisfied that Monsel's salt will accomplish more in a given time than any other escharotic that has ever been employed.

LECTURE XLVI.

SECONDARY SYPHILIS.

GENTLEMEN: Before describing the numerous varieties of secondary syphilis, their causes and relative frequency should first be determined.

1st. Can secondary symptoms result from gonorrhœa?

Although Vidal and other distinguished authors, whose opinions should be respected, believe that cases of syphilitic gonorrhœa do exist, and exercise the same influence in producing constitutional symptoms that chancre is universally admitted to exert, still differences of opinion exist in consequence of the absence of a sufficient number of properly authenticated cases, not only to remove all doubt upon the subject, but also to render it even probable that such symptoms ever originate from that source. I have never observed any variety of secondary syphilis produced by an uncomplicated case of gonorrhœa, either when entirely neglected or treated with simple remedies.

That both chancre and gonorrhœa may be contracted and exist at the same time in the urethra, is unquestionably true. With cases of this character, every experienced physician is familiar, and is it not more rational to suppose in all doubtful cases, that both diseases did exist, and to attribute the constitutional affection to the one from which they are always expected to result when not methodically treated, rather than to the other, from which, unless more positive evidence can be adduced, the possibility of their occurrence should not be admitted?

2d. Is the probability of the appearance of secondary syphilis diminished by any method of treatment that can be employed?

So soon as it was ascertained that chancre could be cured without mercury, its efficacy for the eradication of the poison, and consequently the prevention of the consequences, was also denied. By many it was abandoned, as not only useless but highly dangerous, and by

others because they believed it to be more injurious than the disease for which it was administered.

Experience has proved that chancre can frequently be cured without mercury, and it has also been established, incontestably, that secondary symptoms are more frequent and aggravated when it has not been employed in the treatment of the primary affection.

Besides the cause before mentioned, which is certainly the principal and most influential, warm baths, excesses, wounds, and especially cold, may act as exciting causes when the predisposition exists.

If an opinion were formed from the writings of Leonicenus, Conrad, Gilinus, and Torella, no doubt would be entertained, that cutaneous affections were not only the most common variety of secondary disease, but that pustules were the characteristic affection of the skin. That opinion would not, however, be sustained by experience, as alterations of the mucous membranes are unquestionably more frequent than are even diseases of the skin, which some writers think they resemble so closely that they have endeavored to establish their identity, and with some appearance of success. Baumé contends that the syphilitic affections of the buccal mucous membrane present all the peculiarities of the following varieties of cutaneous disease: Exanthemata, papulæ, squamæ, pustulæ, besides several distinct and more extensive forms of ulceration. In his description of what he considers different forms of syphilitic ulceration of the mucous membrane, he certainly exhibits great familiarity with its specific affections, yet it must be admitted that they neither subserve useful nor practical purposes, as it is always desirable to simplify a difficult subject rather than to render it more perplexing and obscure. Two distinct varieties certainly exist.

First. A simple erosion of the buccal mucous membrane, more or less red, and occasionally whitish in the centre. This frequently appears upon the hard and soft palate, the pharynx, the cheeks, lips, and tongue. Although they present a different appearance in different subjects, they agree in this, that they are all superficial, and their progress is easily arrested. But it should not be forgotten that they return more readily and frequently than any other form of secondary syphilis, and, notwithstanding the opinion of most writers to the contrary, are the most difficult to eradicate. In this form of ulceration the mucous membrane is seldom destroyed, unless it be neglected until the system becomes deranged by the influence of the poison,

and then it may assume the same appearance and progress with the same rapidity as the following forms of ulcerations about the mouth.

Second.—This is really the secondary chancre, and presents its peculiarities. The edges are abrupt, indurated, and elevated, and its surface is covered with a yellowish or grayish membranous secretion. It progresses with great rapidity, and not only destroys the mucous membrane, but also the subjacent tissues. It frequently follows the simplest primary affection, and is so insidious in its progress that the tonsils and soft palate are destroyed without any inconvenience being produced except a slight difficulty in deglutition. Sometimes, when situated upon the posterior surface of the velum palati, or the pharynx, the former is perforated and the latter extensively ulcerated before the patient is aware that he is suffering from anything more serious than a simple catarrhal affection. When located upon the tongue, they sometimes progress with so much rapidity that they are, even by experienced and scientific physicians, regarded as cancerous, particularly when they result, as is not unfrequent, from a very slight primary affection.

Physicians are often misled by their patients, who have forgotten even the existence of a chancre, and protest against the possibility of the disease resulting from a specific cause.

In 1858, a patient consulted me who had an extensive ulceration of the left tonsil and palate, by which the former and nearly half of the latter were destroyed, accompanied with considerable enlargement of the ganglia of the neck. The ulcer was regarded as cancerous by his physicians, and he appeared to be so confident, both of the correctness of their opinions and of the impossibility of the existence of a syphilitic affection, that he regarded it as an insult even to be questioned upon the subject, and would only consent to submit to a specific treatment when informed that it afforded him the only chance of safety. If syphilitic, it could be cured, but if cancerous, not a shadow of hope remained of permanent relief. Besides the extensive and rapidly increasing ulceration, his general health was greatly impaired. After remaining a few days, he left San Francisco, as he supposed, to die of cancer. In a few months I ascertained of a patient who consulted me by his advice that he was entirely relieved of the difficulty from which he suffered so much, both physically and mentally, and intended, in a short time, to visit the city for the purpose of submitting to an operation to remove the

inconvenience resulting from the extensive destruction of the soft palate.

More recently a patient visited San Francisco, from one of the cities in the interior, where he had been treated for an ulcer upon the superior and left side of the tongue. Having no interest in endeavoring to deceive his physician, he assured me, when questioned upon the subject, that he had never had any form of venereal disease, and that it must be a cancer, as his previous physicians supposed. Believing it to be syphilitic, I requested him to endeavor to recollect whether, during the previous year, some slight ulceration had not existed upon the genitals. Upon reflection he finally arrived at the conclusion that a small ulcer did appear some months before, while at Los Angeles, but had healed in a few days without treatment. Being anxious to determine the true character of the difficulty, one of the margins of the ulcer was removed, and examined microscopically by my friend, Dr. Trask, of San Francisco, who pronounced it simple, being unable to detect cancer-cells by the aid of a powerful instrument. Antisyphilitic treatment was prescribed, and when he returned to San Francisco, a few weeks subsequently, the ulcer had entirely healed. This case is the more important, as the ulcer was examined by some of the most talented and scientific physicians in the State, who, from its appearance and history, regarded it as malignant. If it had been a cancer, it would not have yielded to antisyphilitic treatment.

This form of syphilitic ulceration frequently extends to the larynx, destroys the voice, and by the contraction resulting from the cicatrization, when subjected to treatment, the larynx becomes so constricted that respiration is difficult and sometimes almost impossible. A very remarkable case of this kind occurred in San Francisco in the spring of 1858. John Schmidt contracted the disease in 1851, and suffered from that time until the period before mentioned, successively, with every form of the disease. The ulcers, which commenced in the throat, finally extended into the larynx, and no relief was obtained from the treatment to which he had been subjected. Suffocation being imminent, I was requested by his friends to visit him, with the hope that temporary relief might be afforded by an operation. His breathing was so difficult that each inspiration could be heard in any of the adjoining houses. The skin and cellular tissue upon the anterior part of the neck were excessively thickened by the long-con-

tinued use of both rubefacients and blisters. Believing that his life could only be prolonged by an operation, laryngotomy was performed immediately, and a tube introduced. The hæmorrhage, both during and for a few hours subsequent to the operation was inconsiderable; but in the evening, upon removing the tube to clear it of the mucus by which it was obstructed, bleeding became so profuse as to endanger life. Finding it impossible, without enlarging the wound, to ligate the vessels, Monsel's salt was applied, and, by its extraordinary hæmostatic properties, I was relieved from an exceedingly unpleasant position. The ordinary tracheal tube, goose-quills, or the section of a gum-elastic catheter have now been worn for several years. Proper treatment was substituted for that previously prescribed, his general health improved greatly, the specific action was controlled, and its entire eradication was probably effected. When conversing, he placed his finger upon the extremity of the tube; its presence produced but little irritation or inconvenience; the embarrassment of the lungs resulting from the long-continued and excessive efforts required for respiration entirely disappeared, and he became quite comfortable, notwithstanding he has been preserved from suffocation by artificial means for a longer period than any other patient whose case has been recorded.

Secondary ulceration is not confined to the buccal mucous membrane, but frequently either extends to the mucous membrane of the nose, or is developed there before the mouth or throat becomes affected. At first a simple irritation exists, which may be mistaken for an ordinary catarrhal affection, and gradually increases until the mucous membrane becomes ulcerated, accompanied with a thick, yellow purulent discharge. When entirely destroyed, the bones are exposed, become denuded, and ultimately carious, and when detached may escape anteriorly, or through the soft palate, which frequently ulcerates in consequence of the irritation produced by the diseased palate-bones resting upon its superior surface. So soon as the vitality of the bones is destroyed, the discharge becomes profuse, and is accompanied with an excessively offensive odor.

Caries of the small bones of the nose may result either from secondary or tertiary syphilis. In the former the disease commences in the mucous membrane, and in the latter the periosteum is primarily affected.

The most remarkable case of caries of the nasal bones resulting

from secondary syphilis which I have either seen or treated, occurred in 1857. A gentleman of good constitution, and in fine health, contracted syphilis in San Francisco, and was treated as such cases too frequently are in this city. In a few weeks, secondary ulceration of the skin and irritation of the mucous membrane of the nose supervened. Although several months elapsed before he became my patient, all the bones of the palate and nose were diseased, and an opening an inch in diameter existed between the month and the nasal cavities. The purulent discharge was profuse and intolerably offensive. An ulcer extended from the superciliary ridges to the posterior parts of the parietal bones. His general health was greatly impaired, and his condition as unfavorable as can possibly be imagined. The deutochloride of mercury, combined with the iodide of potassium, and the compound decoction of sarsaparilla, together with porter and a generous diet, were prescribed. His general health improved daily, the external ulcer healed, and in three months his weight increased fifty-six pounds. The diseased bones being movable, they were all extracted through the opening in the soft palate, which being accomplished, the fetor disappeared, and as no symptoms of disease existed, the treatment was discontinued. Neither the nasal bones nor those by which they are supported being implicated, the nose has retained its original conformation. The opening in the palate has been covered so perfectly by a dentist that his voice is restored, and but little evidence remains of the extensive ravages committed by this fearful disease in so short a period.

In many cases the mucous membrane covering the septum and the cartilage is destroyed, by which the nasal passages are converted into a common cavity. So little inconvenience frequently results from this difficulty that the patient is ignorant of the existence of anything more than irritation of the membrane until the destruction of the cartilage is complete, by which the nose is flattened, and an exceedingly unpleasant deformity produced, which cannot be removed.

By extensive ulceration of the throat the Eustachian tubes are frequently implicated, from which partial deafness may result. The meatus auditorius externus is also occasionally affected, and very troublesome vegetations close the canal, and as long as they remain the function of the organ is destroyed.

When other varieties of secondary syphilis exist, the mucous mem-

brane of the vagina, glans penis, and urethra sometimes becomes inflamed, and is accompanied with a very unpleasant discharge, which, I am confident, is often mistaken for primary syphilitic gonorrhœa, from which, as many suppose, constitutional symptoms result.

When neglected, ulceration of the mucous membrane, both of the vagina and uterus, frequently occurs, which can only be removed by a specific treatment.

In the consideration of secondary ulceration of the mucous membrane, the question necessarily arises, is the discharge in that stage communicable, either by contact or otherwise? Vidal says that secondary syphilis is inoculable, and experience has convinced me that in cases where there was no probability of the disease being contracted from a primary ulcer, it did exist, and presented all the peculiarities of a primary affection.

In one of the cases referred to, a gentleman was married when suffering from secondary ulceration of the mucous membrane of the lips and throat. In a few weeks a chancre appeared upon his wife's left nipple, which yielded to the ordinary treatment, but the lady, being ignorant of the character of the disease, could not be induced to continue the treatment sufficiently long to eradicate the virus. In six weeks she had the same affection of the mucous membrane of the mouth that existed in her husband's case, and it was soon followed by a syphilitic cutaneous eruption.

Syphilis is also hereditary, and may be communicated either by the father or mother. Vidal thinks that the virus exists in the blood, and consequently that semen secreted from impure blood possesses the same qualities. If a pregnant woman be affected with secondary syphilis, the child is frequently expelled prematurely, and is covered with syphilitic ulcers, by which the process of gestation is interrupted.

Treatment.—Although, as I before said to you, superficial ulcerations of the mucous membrane of the tongue, mouth, or throat, are generally regarded as very simple and easily cured, I have always found them less amenable to treatment than cases of a much more serious character. In consequence of their uniform obstinacy, I have tested the relative efficacy of the various remedies that have been recommended, and have found no difference in the action of the protiodide of mercury and blue mass. They should be administered

in the manner that I described in a previous lecture, and continued much longer than in any other secondary affection, in order to prevent a recurrence, as relapses are more common in this than in any of the more aggravated forms of the disease. In combination with the mercurial treatment, the compound decoction of sarsaparilla is exceedingly valuable, particularly when the general health is impaired. It is both a tonic and an alterative, and thereby increases the tolerance of the system to the mercurials that may be found necessary.

In the more destructive forms of ulceration of the mucous membrane of the mouth and nose, the iodide of potassium is relied upon almost exclusively by many celebrated physicians, which to me is very surprising, as I have long been convinced by experience that in syphilis it is not a curative remedy. Ulcerations of the mucous membrane will disappear during its administration, but very soon after it has been discontinued they invariably return; not a single exception has been observed, where the condition of a patient treated with this article alone could be possibly ascertained after a sufficient time had elapsed for the disease to reappear.

In those cases which frequently progress with so much rapidity as to endanger the tissues upon which the mucous membrane is located, the iodide of potassium should be combined with a mercurial, and given as freely as can be tolerated; eight grains of the salt combined with deutochloride of mercury is certainly the best preparation that can be administered. When taken even in that quantity, it frequently produces very unpleasant symptoms, such as distressing pain through the anterior part of the head, as well as inflammation of the mucous membrane of the eyes, nose, and mouth, accompanied with a profuse discharge of mucus and saliva. When these effects are produced, it should be discontinued until they disappear, when it may be resumed in similar doses. Should a tonic be necessary, none will be found more useful than the decoction of sarsaparilla which I have before recommended.

Local Treatment.—A solution of the iodide of potassium in water, one part of the former to ten parts of the latter, is highly recommended as a local application, which should be either applied with a brush or used as a gargle, as may be most convenient.

Van Swieten's liquor, in eight parts of water and double the

quantity of honey, is highly recommended by Vidal, and is, in many cases, very valuable.

One part of muriatic acid diluted with two parts of water, is a very efficacious local remedy, and when more simple means fail, it should be employed. A physician in this city has great confidence in a solution composed of twenty grains of the deutochloride of mercury, twenty grains of the muriate of ammonia, and one ounce of water; this solution should be applied daily with a brush, and continued until the ulcers disappear.

The solid nitrate of silver, either in simple or irritable and painful ulcers of the mucous membrane, when not progressing with great rapidity, is equally as efficacious and much more convenient than any other local remedy; although when they are extending rapidly, pure nitric acid should be applied. This may not be superior to the muriatic acid, yet having often arrested phagedenic ulcers, both in the mouth and upon other portions of the body, with nitric acid, I rely more confidently upon its action than upon any other article with which I am less familiar.

LECTURE XLVII.

SECONDARY SYPHILIS.

GENTLEMEN: Before the syphilitic affections of the skin are considered, it becomes again necessary that I should direct your attention especially to a very common secondary affection of the throat, conjunctiva, prepuce, and vagina, of an exanthematous character, which in my last lecture did not receive the attention necessary to convey a correct knowledge of its character. This is not only a very common difficulty, but also a very hard one to recognize, without the existence of other symptoms. Chronic exanthematous inflammation of the mucous membrane of the tonsils, palate, and pharynx is often mistaken for either a scrofulous or catarrhal affection, and only attracts attention by its great obstinacy. Although it is not accompanied with ulceration, deglutition is both painful and difficult. The mucous membrane is red, thickened, and there is generally also enlargement of the tonsils and submaxillary glands. The mucous membrane of the vagina and prepuce presents the same appearance, and furnishes a morbid secretion, from which, as I before stated, the secondary symptoms most probably result that have been attributed to gonorrhœa.

Syphilides.—The profession is indebted for this very convenient and expressive word to Alibert, one of the most distinguished physicians of the St. Louis Hospital, in Paris. It has effectually removed the error and confusion necessarily resulting from the employment of the term pustule to designate all cutaneous syphilitic affections. To Biett, who was equally eminent, and who labored in the same hospital, we should feel under greater obligations for having classified and arranged them according to the method adopted by Willan in his treatise on the elementary affections of the skin, which has removed much of the obscurity and difficulty previously experienced in the study of the diseases of this tissue.

A familiarity with the syphilides is of great importance to the

physician, for without that knowledge, from their resemblance to the simple affections that present the same appearance, an inefficient treatment might be prescribed and continued till the system became so much deranged by the virus that it would not only be difficult, but often impossible to arrest their progress.

They differ from simple cutaneous affections in color and form, and leave a different impression upon the skin when they cicatrize. In forming a diagnosis the color, both of the eruption and of the adjacent skin, is considered of the greatest consequence. They generally present shades differing from a purplish-red to an earthy-yellow, which is usually termed coppery. This peculiarity of color is sufficiently distinct to remove all doubt respecting their true character, except for a few days after the exanthemata make their appearance, which so nearly resemble roseola, that if other circumstances were not considered an error might be committed. When doubt exists, if the red color be removed by pressure, the coppery appearance is rendered more distinct. It remains because it has been produced by a pigment that has been deposited in the skin, and which is consequently more permanent than that produced by mere vascular engorgement of the part.

Form stands next to color in importance. Syphilides usually, and those of long standing almost invariably, present curves which represent portions of a circle. This peculiarity has long attracted the attention of physicians, and accounts for the origin of the term, "corona veneris."

Cicatrix.—It is well known that ulcers are more common in the syphilitic than in the elementary diseases of the skin, and that they present a different appearance. Their edges are abrupt, elevated, and frequently indurated, and the surface is covered with a grayish secretion, which is detached with great difficulty. This peculiarity is particularly observed upon the extremities, although it is apparent wherever the ulcers are located. In consequence of the form, depth, and irregularity of these ulcers, the cicatrix presents a different appearance from that usually resulting from simple cutaneous affections.

Although an experienced physician, who is familiar with the peculiarities which I have just described, seldom experiences the slightest difficulty in recognizing even the more complicated syphilitic eruptions, he should always obtain the history of the case, and observe

the constitutional condition that may exist, before determining upon a course of treatment.

Incubation.—The time that elapses between the date of the affection and the appearance of the disease has received this appellation.

This period varies from six weeks to several months, and according to the latest writers upon the subject may extend even to many years. It is generally believed that they formerly appeared much sooner than at present, and exhibited greater uniformity in their character. Before syphilitic eruptions appear, febrile symptoms often exist for several days, and frequently continue during the acute stage; this is particularly the case in subjects constitutionally feeble, or who have been rendered so by previous disease, which makes the treatment more difficult, and the effects of remedies more uncertain if prescribed during their continuance.

Thirty years ago Lagneau, who was regarded as one of the ablest writers upon the subject, considered all syphilitic eruptions pustular, and described them as miliary, urticose, lenticular, formicular, psoriasic, herpetic, crustaceous, and ulcerous pustules, which is much less simple and satisfactory than the arrangement adopted by Biett and his students, and previously pursued by Willan in his treatise on the elementary diseases of the skin, a correct knowledge of which is indispensable to the study of the syphilides. The varieties that are admitted and established will only be given:

1st. Exanthemata.
2d. Papulæ.
3d. Squamæ.
4th. Vesiculæ.
5th. Bullæ.
6th. Pustulæ.
7th. Tuberculæ.

To which may be added onychia and alopecia.

1st. *Syphilitic Exanthema.*—This appears in irregular red spots, separated by healthy portions of skin, and in consequence of the striking resemblance that exists to roseola vulgaris, they naturally belong to the same class. Although the skin is red, and presents a rough appearance to the touch, it is not distinctly elevated. This eruption frequently appears suddenly, and is seldom accompanied with much fever or distressing pruritus; after it has existed a

few days, the coppery color peculiar to all the syphilides becomes very distinct. In consequence of the absence of fever, the persistence of the eruption, and the color it assumes, it cannot be mistaken for roseola vulgaris, the only disease to which it bears a strong resemblance. This is one of the most simple, most readily diagnosed, and most manageable of all the syphilitic eruptions.

2d. *Syphilitic Papulæ.*—In this form of the disease small, dry, and firm elevations appear, of a decided copper color, which do not contain any fluid, and which terminate either by resolution or desquamation. They present no regularity in their arrangement, are generally more numerous upon the anterior portions of the lower extremities, and are frequently preceded by syphilitic rheumatism or by inflammation of the iris or conjunctiva.

I was consulted, some time since, by a man who was suffering from conjunctivitis, and as he complained of pains in the lower extremities, they were examined, and were found to be covered with papulæ of the variety termed lichen; the tumors were very small, although numerous, of a yellow color, and in a state of desquamation. He had been treated for a chancre a few weeks previously, but had discontinued the treatment before the disease was eradicated.

Occasionally the papulæ are much larger, distinct, and copper-colored; they always progress slowly, and generally terminate by resolution. This affection was formerly described as syphilitic urticaria, from the strong resemblance which it presents to that affection both in its appearance and termination. Iritis is one of its most common complications.

3. *Syphilitic Squamæ.*—This variety of secondary cutaneous disease, as its name indicates, presents a scaly appearance, which results from the desquamation of the cuticle. The pimples are more or less elevated, of a dull-red or copper color, and are frequently observed after an erythematous or vesicular eruption has disappeared. When primitive, they frequently assume the form of the common varieties of psoriasis, and may exist either in distinct blotches or circles. The former may either be separated by healthy portions of skin, or so numerous that their margins are in contact. They vary in size from a bean to a twenty-five cent piece, and resemble the eruption in psoriasis only in form and size. When the summit ulcerates, and the secretion escapes and desiccates, they generally present a scaly appearance, although occasionally they are smooth

and polished. The surface, after the scabs are detached, is generally smooth and of a dark or livid color.

Circular Psoriasis or Syphilitic Leprosy.—The circles represented by this eruption vary in size from two or three lines to half an inch in diameter, and are generally dark-brown, violet, or blackish in the centre, and frequently enlarge by healing in the centre and extending at the margins. These rings are composed of pimples, which present a red base and a summit filled with yellow pus. They are most frequently located upon the forehead, and constitute what was originally called the crown of Venus. When this eruption appears upon the palms of the hands and soles of the feet, the scales are thicker, more firm and horny, resulting from the character of the epidermis by which they are covered, which is both thickened and indurated, and consequently deprived of its elasticity. The motion of the fingers is not only impaired, but large fissures are also formed, that are both painful and exceedingly obstinate. The eruption might be confounded with psoriasis vulgaris, from which, however, it differs by the almost entire absence of pruritus, as well as by the presence of the copper color of the skin surrounding the eruption. This form of secondary syphilis was formerly described as pustular psoriasis.

4. *Syphilitic Vesiculæ.*—When the cuticle is elevated by a serous or sero-purulent secretion, a vesicle is produced. This variety includes all the syphilitic eruptions characterized by vesicles, which may be designated syphilitic eczema, syphilitic herpes, and syphilitic varicella. In this form of the disease the vesicles are generally small, transparent, and sometimes pearly white. When punctured, they frequently refill, but occasionally the summit becomes dry, and is covered with a yellow scab or thin scale. In other cases the eruption consists of a dark-red blotch, covered with prominent vesicles, which are firm, remain stationary, and finally disappear, leaving the affected part of a copper color, either smooth or covered with a slight desquamation. This is the most common variety of syphilitic eczema.

5. *Herpes Syphilitica.*—In this affection the vesicles are generally arranged in circles, and vary from three lines to an inch in diameter. The number of these circles is very limited, and cannot easily be mistaken for herpes simplex, in consequence of the distinct yellowness of the skin surrounding the base. When this variety appears

near the anus, it receives the name of prurigo podicis, and is one of the most distressing and troublesome of the venereal affections. It frequently extends to the scrotum and upper part of the thigh, and is accompanied with excessive itching, especially at night. It is of a brownish copper-color, and sometimes becomes ulcerated and covered with a whitish secretion similar to that observed in the throat.

Women are affected with the same variety of syphilitic herpes, which is known as prurigo pudendi, and appears upon the labia, orifice of the vagina, and upper part of the thighs, and is attended with excessive pruritus. The eruption is first characterized by small deep-red pimples distributed over the parts just mentioned. When chronic, the skin presents a yellowish-brown or uniform livid tint. This affection should not be confounded with the pruritus that affects pregnant women or those in whom the menstrual discharge is suppressed.

I treated, in 1858, an extraordinary and distressing case of prurigo pudendi, in a patient from the interior of the State, in which the labia were enormously enlarged, and the mucous membrane and skin at the orifice of the vagina, and upon the thighs, was thickened and covered with a thin, irritating, and offensive discharge. The pruritus in this case was intolerable, and the excessive swelling of the labia was probably produced by the violence resulting from the means resorted to for the purpose of obtaining temporary relief. Extensive ulceration of the rectum with contraction also existed.

4. *Syphilitic Varicella.*—This is much more common than either of the other varieties. The vesicles are scattered irregularly over the body, and are either globular, acuminated, or umbilicated. The serum which they contain frequently becomes turbid and purulent, and then they resemble varioloid more than varicella, from which they can be distinguished by the color which they present, which is peculiar to every variety of secondary eruption, and is so distinct that it cannot be mistaken by an experienced physician, even upon the most superficial examination.

5. *Syphilitic Bullæ.*—This affection rarely occurs in the adult. The vesicles are much larger than in the preceding variety, although not more elevated. In magnitude they vary from the size of a pea to that of a goose-egg. Two distinct varieties have been observed. After maturity, when the vesicles are covered with scabs, it is called pemphigus, and rupia when a thick scale or crust is formed.

Syphilitic Pemphigus.—The vesicles, as they may be called, although sometimes filled with a sero-purulent fluid, in this variety of bullæ, rarely exceed in dimensions a twenty-five cent piece, are surrounded by a red areola until they open, and then they are covered with scales, and around the base the copper color is distinct. This variety of the disease is common in young children soon after birth, and is frequently complicated with disease of the lungs, which generally proves fatal.

Syphilitic Rupia.—This is more common than pemphigus, and is characterized by large bullæ, which are flat, generally round, and are surrounded by a copper-colored areola. They contain a blackish fluid, which, when it escapes, speedily desiccates. This eruption may appear upon every portion of the body, although it is most common upon the forehead and scalp. Generally the number is limited to two or three, and these, when upon the extremities, are usually very large. When the ulcerated surface is extensive, an enormous black or brown conical scab is formed, which, if not detached, either by violence or by some oleaginous application, frequently becomes more than an inch in length.

A very distinctly marked case of syphilitic rupia was treated in the United States Marine Hospital, in 1857. The patient was young and large, although of a scrofulous habit, there being several cicatrices on the neck resulting from that disease. The primary disease was treated by the usual remedies, but before the chancre healed, he lost his appetite, fever supervened, and continued until the bullæ made their appearance. Besides several of large size upon the body, two appeared upon the forehead, which contained a dark-colored fluid, and by its escape and desiccation black scabs more than an inch in length were produced. Great prostration, with syphilitic rheumatism, invariably followed the use of mercury, even in the smallest doses, and when combined with iodide of potassium, which rendered it necessary to suspend its administration frequently for more than a week during the treatment. Although this case was for several months very unpromising, by generous diet, the mixture which has been before described, the compound decoction of sarsaparilla, and the free use of porter, the ulcers finally healed, but were followed by tertiary symptoms, which rendered a continuance of the treatment for several months indispensably necessary.

A deep, irregular, and extensive cicatrix now represents the site of each of the ulcers, which will never disappear, although he has, for several years, enjoyed uninterrupted health. This form of disease becomes serious in proportion to the constitutional debility that may exist. It generally progresses slowly, and is as obstinate as any other form of secondary syphilis.

6. *Syphilitic Pustulæ.*—A small tumor produced by the elevation of the cuticle by a purulent secretion is called a pustule. This syphilitic eruption was more common about the end of the fifteenth century than at present, and was described as lenticular, from the resemblance of the pustules, both in size and shape, to the vegetable product, a sort of bean, from which they derived their name. Two distinct varieties have been observed, syphilitic impetigo and syphilitic ecthyma.

The former may be either distinct or confluent. The pustules in the simple or distinct form are but slightly elevated, and generally are not very numerous. The base is not indurated, and presents a copper color. When neglected, scales are formed from the exfoliation of the cuticle, and occasionally small scabs appear, by which an ulcer is concealed, that usually leaves a firm and permanent cicatrix.

The confluent form is frequently preceded by lassitude and fever. The skin presents a red color before the appearance of the pustules, which are so numerous as to become confounded, and are soon covered with a soft, unequal, or greenish scab, which is convex in the centre, leaving, when detached, an irregular ulcer with abrupt edges.

Syphilitic Ecthyma.—In ecthyma syphilitica the pustules are larger than in impetigo, although they rarely exceed an inch in diameter. They are rapidly developed, soon mature, and become covered with a thick scab. These are frequently so large as to be mistaken for rupia, from which they can easily be distinguished, if seen before the pustules mature. They frequently appear upon the lips and alæ of the nose, and are both obstinate and destructive.

In July, 1874, at the County Hospital, I found a man in my ward who had a syphilitic ulcer which involved the entire upper lip, and extended on the left side below the lower edge of the inferior maxillary bone. His palate was destroyed, his nose disfigured, and altogether his condition was anything but encouraging.

I put him under the antisyphilitic treatment which is now prescribed in my wards in the County Hospital. In a week or two he had improved so much that I decided to remove the ulcer and transplant enough healthy skin from the side of the face to supply the deficiency. Although he had erysipelas, the wound healed by

Fig. 82.

the first intention, and now his is one of the most successful operations that has ever been performed in this or any other State. It was witnessed by the entire class of the Medical Department of the University of California. He is now in good health, and if any member of this audience wishes to see him, he works at No. 58 Market Street, San Francisco.

7. *Syphilitic Tuberculæ.*—Before these have made much progress they resemble papulæ. These tumors are generally small, solid, and deepseated, and differ from papulæ especially in the strong tendency to ulceration which they always exhibit.

Simple tubercles may either be distinct or appear in groups; in

the latter form they are small, round, and arranged in circles, each tubercle being covered with a thin, grayish-colored scab. They are generally indolent, and may terminate by resolution, without leaving a cicatrix. Sometimes the groups are very irregular, and present the copper color more distinctly than any other variety, and after existing for a considerable time ulceration frequently occurs.

Tubercles are generally large, flat, oval, or spherical. They occasionally remain smooth and polished, but more frequently they are covered with thin scales. After ulceration occurs, however, thick scabs are formed. From this variety of the disease, the greatest proportion of the extensive phagedenic and serpiginous ulcers result. The former not unfrequently destroy the skin and cellular tissue so extensively as to expose the muscles and bones. The edges of the ulcerated surface resulting from their extension are both elevated and abrupt; the surface is either gray or blackish, and interspersed with bleeding points.

They are exceedingly painful, and furnish a bloody or red secretion; ulcers of this character are common, and frequently appear upon the penis, mons veneris, and the extremities, and heal slowly and with difficulty.

Phagedenic ulcers are common in scrofulous patients, or in those debilitated either by chronic disease or intemperance.

Tubercular serpiginous ulcers are more superficial than the preceding, and may appear upon any portion of the body, but more frequently upon the face and trunk. Before ulceration occurs they are smooth, with a brownish-violet base, which is characteristic of almost all syphilitic eruptions. They are called serpiginous because they heal on one side whilst they extend on the other, and leave a track upon the skin which may be traced by the dark color that remains after cicatrization has been completed, the convolution and spiral course of which resemble the windings of a serpent. They are more common upon the back and anterior portion of the chest, although they may occur upon the face. They are less destructive than the phagedenic ulcers, although equally obstinate.

LECTURE XLVIII.

GENTLEMEN: In this lecture the secondary affections known as alopecia, onychia, syphilitic rheumatism, syphilitic sarcocele, syphilitic gummy tumors, syphilitic conjunctivitis, and syphilitic iritis will be considered.

Alopecia.—If by this term we are to understand an entire and universal loss of the hair, it is highly probable that at an earlier period in the history of syphilitic affections it was a much more common occurrence than at present. A partial difficulty of this character, even during the existence of both primary and secondary affections, is not unfrequent. Generally it appears to result from a disease of the skin, in which there occurs a slight desquamation of the cuticle, which is followed by a thinning of the hair, eyebrows, and whiskers.

The cutaneous affection, known by the slight desquamation and discoloration that exists, and by which it is evidently produced, is so inconsiderable as either not to attract attention or to be considered as a simple case of pityriasis versicolor, resulting from derangement of the hepatic secretion, and can only be distinguished from that affection by the complication above indicated. Complete and universal alopecia, as I before stated, seldom occurs, and then only in patients in whom the entire system is poisoned by the virus. When the disease is partial, the true skin is not implicated, and so soon as the constitutional affection is controlled, the hair is reproduced; but when it appears at a later period, during the existence of venereal cachexia, and is entire, it is then a much more serious difficulty, and even under the most judicious treatment is frequently unmanageable, because the pilous bulbs are so seriously affected that their functions are destroyed. No symptom that could occur during the progress of the disease is more unpleasant, in consequence of the decided and undesirable change it produces both in the appearance and expression of the face.

Onychia.—The matrix of the nail, as the consequence of the existence of a venereal affection, sometimes inflames, becomes thickened

and furnishes a morbid secretion, accompanied with both a discoloration and a brittleness of the nail; or it ulcerates, by which the nail is detached from its connections, and is easily removed. If the matrix ulcerates only, and is not destroyed, the nail is reproduced so soon as the progress of the constitutional affection is arrested. That cannot occur, however, if the matrix be destroyed, for it would be as rational to suppose that a bone could be reproduced without the preservation of the periosteum, as that without the matrix, or bulb, either a hair or a nail could be restored. The place occupied by the nail, in cases where there is an entire destruction of the matrix, is represented by a cicatrix, with probably a few irregular, horny excrescences, which do not in the slightest degree resemble the original formation. The affection frequently occurs after the disappearance of either a cutaneous eruption or rheumatism, and when ulceration exists, it is sometimes so painful as to prevent sleep. Some time ago I treated a case in this city which had been preceded both by a papular eruption and by rheumatism, and was confined to the fingers of the right hand. Although the matrix of the nails was so violently inflamed that an abundant and offensive purulent discharge was produced, the disease yielded to the ordinary treatment, and no material change in the appearance of the nails resulted.

Syphilitic Rheumatism.—This may either precede or occur after the disappearance of the syphilides, and may be located either in the muscles, tendons, or aponeuroses. During the first stage it is often accompanied with violent pain, particularly during muscular action, and may be mistaken for a simple rheumatic affection, from which it is often with difficulty distinguished, if the history of the case is not considered. When more advanced, the muscles frequently become permanently contracted, and particularly the biceps of the arm; the contraction may continue until partial or complete anchylosis of the joints results. When located either in the tendons or joints, they frequently swell, and occasionally an abundant serous secretion occurs, which is both painful and inconvenient. If neglected, tumors, called nodes, are developed either in the muscles or tendons, which sometimes become solid. At first a serous and plastic secretion is deposited, either between the muscular fibres or in the fibrous tissue of the tendons, and gives great pain whenever the muscles contract. Suppuration occasionally, though rarely, occurs; and in this respect the progress is not unlike that of ordinary rheumatic in-

flammation. When, however, the local inflammation is very considerable, and is accompanied with fever, suppuration sometimes takes place in the centre of the muscles, from which extensive destruction of tissue often results. More frequently, when neglected, the deposits are converted into fibrous or osseous tumors, and then, although the virus may be eradicated, they are exceedingly difficult to remove, either by local or constitutional treatment. They are generally located in the biceps, pectoralis major, vastus externus, or trapezius, and not unfrequently in the muscles of the eye and tendons of the fingers. Several cases of the latter variety have fallen under my observation.

A very obstinate and distressing case of syphilitic rheumatism was treated recently in this city, in which both the joints and muscles were affected, accompanied with permanent contraction of the latter, and with enlargement and partial anchylosis of the former. The biceps of the left arm was contracted without enlargement, and the ankle and knee-joints of the same side were painful, swollen, and almost completely anchylosed. Soon after the disease was contracted, the patient left in consequence of the supervention of a pulmonary affection; and after remaining away five months, returned greatly emaciated, with loss of appetite, with constant fever, and in the condition in which I before described. Believing mercurials to be inadmissible in his prostrated condition, iodide of potassium, with the extract of actea racemosa, were administered as I shall hereafter describe, and in ten days the pains disappeared entirely, his appetite returned, and being allowed animal food *ad libitum*, in two weeks he was able to take moderate exercise. The motion of the joints was gradually restored by forcible flexion and extension under the influence of chloroform, and the use of the limbs is now as perfect as before the occurrence of the disease.

Syphilitic rheumatism is so common that the syphilides seldom exist long without being accompanied with this affection, which is one of the most distressing complications that could occur. As I before said, when it supervenes during the early stages, symptoms of inflammation only, such as pain, increased heat, and swelling, exist, but subsequently, after the system has become poisoned by the virus, deepseated abscesses or nodes are developed, either in the muscles, tendons, or aponeuroses, and then it becomes not only serious but highly dangerous.

Syphilitic Sarcocele.—After the cicatrization of a chancre, or during the existence of any variety of secondary disease, or even after they have disappeared without the virus being eradicated, a patient frequently complains of pain in the loins and uneasiness in one or both testicles. At first, they present but little change, either in appearance or density; subsequently, however, the glands are more painful, particularly at night, enlarge slowly, and become more solid and heavy. The increase in magnitude appears to take place by lamellæ, and the solidity is in proportion to the time it has existed. Although the disease generally commences in one testicle, they both very soon become implicated.

This affection is decidedly chronic, not very dangerous, and although by neglect it may destroy the organs by suppuration, if properly treated such a result should not be apprehended. The most striking peculiarity in the progress of this disease is, that although the testicle may enlarge considerably, become very hard and painful, the original form of the organ is preserved.

It may be readily distinguished from orchitis by the rapid progress of the latter, and the almost entire exemption of the epididymis, which in orchitis becomes affected before the glandular structure is implicated. In orchitis the scrotum is more or less distended with serum, the pressure of which upon the inflamed organ produces the excessive pain by which the disease is accompanied, and which does not occur in the difficulty under consideration.

In strumous enlargement of the testicle the gland is less solid, the surface more irregular, and it generally occurs in subjects of a decidedly scrofulous diathesis.

When malignant disease exists in this locality, it is almost always confined to one testicle, and after it has made sufficient progress to excite attention, the skin soon becomes implicated, which rarely takes place in syphilitic sarcocele. This disease is decidedly chronic, and may exist several years without undergoing much change, although when neglected it either impairs or completely destroys the sexual power, in consequence of the entire cessation or diminution of the seminal secretion. But if properly treated before the glandular structure of the organs is destroyed, although they may become slightly atrophied, or even diminished considerably in size, impotence does not necessarily follow. For want of confidence, many imagine themselves in that condition when it does not really exist.

Complete and irremediable impotence is very rare, even after both testicles have suffered from the disease.

Syphilitic Gummy Tumors.—In this variety of secondary syphilis the cellular tissue only is implicated, and the skin, for a long time after it becomes indurated, remains in a normal condition. They usually appear after the system has become seriously affected by the poison, and are generally located near the bones or upon parts where nothing but cellular tissue intervenes between them and the skin, although they may appear upon almost every portion of the body.

They vary greatly in size, are movable, appear to be encysted, are extremely indolent, and contain a gluey matter which resembles a mucilage made of gum tragacanth. They are genuine abscesses that are exceedingly indolent, and contain pus only after a protracted inflammatory action. Usually they are developed in the cellular tissue that unites the skin and bones, as upon the cranium, clavicles, ribs, tibia, radius, or ulna. Sometimes they appear elsewhere, but almost always upon parts that are either ligamentous or aponeurotic. Generally their appearance is preceded by dull pains in the part affected, although many cases occur in which neither pain nor uneasiness is experienced. Under certain circumstances, these tumors become more solid, acquire the magnitude of a walnut, and remain several years indolent, but if not arrested by proper treatment, they ultimately inflame and discharge a ropy substance, which may either be white, transparent, yellowish, or red.

Two very distinct cases of this character have been quite recently treated. In one, which occurred in the interior of this State, there were three tumors nearly the size of quail eggs. They were apparently encysted, and very movable. Two were situated upon the lateral and anterior portions of the parietal bones, and the third near the external angle of the left eye.

The tumors were regarded by a physician as condylomata, and two of them were extracted. The wounds made for their removal refused to heal, and a proposition being made for a second operation, the patient determined to visit San Francisco. I was induced to believe that they were syphilitic gummy tumors by the history of the case, the general condition of the patient, and the copper color of the ulcers that occupied the original site of the tumors, which characterizes all secondary syphilitic affections. Antisyphilitic treatment was prescribed, and in fifteen days the tumor that had not been sub-

jected to treatment disappeared entirely; but the ulcers required the continuance of the treatment for several weeks before cicatrization was complete. Under this course his general health improved rapidly, and both the tumor and ulcer disappeared without any local treatment, which would not have occurred if they had been simple encysted tumors.

In the other case, five tumors as large as walnuts were situated upon the posterior part of the pelvis, and had made but little progress for some years. They were simply inconvenient, until a short time before he applied to me for advice, when they suddenly inflamed, became painful, and suppurated. Extensive ulcers followed, which yielded to specific treatment. The firmness of the tumors resulted from the great distension and thickness of the cellular tissue of which the cysts were composed. These tumors, before suppuration takes place, are often mistaken for condylomata, and are subjected to surgical treatment; after ulceration occurs, they are frequently considered cancerous, and unsuccessful attempts are made to extirpate them.

Syphilitic Conjunctivitis.—This variety of conjunctivitis is exceedingly common in California, and may precede, accompany, or succeed any syphilitic affection either of the skin or throat. The eye, although excessively red, is seldom very painful. This may readily be distinguished from any other variety of conjunctivitis of apparently the same violence, by the entire absence of photophobia, which is one of the most distressing symptoms in simple inflammation of this membrane. It is generally chronic, and rarely affects the cornea, unless greatly neglected. Whenever one or both eyes are excessively red, and the patient can face a strong light without lachrymation, upon inquiry the existence of syphilitic symptoms will be proved, or will be found to have preceded the difficulty. For its removal, constitutional treatment, in combination with the simplest local applications, is invariably successful.

Syphilitic Iritis.—This is a much more serious affection of the eye than the preceding, and as in that variety, it may precede, exist in combination with, or succeed the syphilides, although it is more frequently preceded by papular eruptions than by any other syphilitic cutaneous disease. Syphilitic iritis is accompanied with pain in the eye, temple, or anterior portion of the head, and is generally more violent at night. Increased vascularity, both of the conjunctiva and

cornea, exists, although not to the same extent as when the disease is of an exanthematous character and entirely external. The motion of the iris being impaired, the pupil is generally irregular, which results, most probably, from an effusion of lymph, and consequently the existence of bands or adhesions by which portions of that membrane are fixed, so that it cannot obey the stimulus of light. Vision is generally disturbed and sometimes entirely destroyed. The dark color of the iris is changed to a greenish hue by the lymph effused, which may be deposited either in the anterior or posterior chambers, or even upon the posterior surface of this membrane, in which locality small abscesses of the iris appear in cases of long standing.

In syphilitic iritis, the fluid effused, whether serum or lymph, is sometimes so abundant that even the sclerotic yields to the profuse flow, and staphyloma of that membrane is produced.

A very remarkable case of this description was reported by me, some time since, in which, after long-continued and most intense suffering, staphyloma of the sclerotic made its appearance upon the superior portion of the eye, with entire loss of vision. After the progress of the disease was arrested, iridectomy was performed, by which not only was the staphyloma cured, but vision was restored.

Syphilitic iritis progresses much less rapidly than traumatic, and is less destructive to the organ. It may change from one eye to the other without being influenced by treatment, and the patient suffers less from photophobia than in simple inflammation of that membrane, although a violent paroxysm of pain is almost always experienced at night.

No individual symptom will indicate positively the character of syphilitic iritis, although, by carefully examining the throat, skin, or anus, evidences of syphilitic disease can almost always be detected. Sometimes syphilitic iritis is complicated with rheumatism, and then but little difficulty will be experienced in determining its character. Should iritis occur without an apparent cause, such as wounds, external violence, or great and protracted exertion of the organ, a specific cause should be suspected, and if not positively ascertained, no serious or permanent injury or inconvenience can result from the administration of specific remedies. Many eyes are lost that might be saved without difficulty by proper treatment, as a sufficient time always elapses between the commencement of the disease and the destruction of the organ, to obtain the full effect of efficient remedies.

I regret, however, that the same cannot be said of gonorrhœal ophthalmia, which is the most violent and destructive disease to which this organ is exposed, and the only one, which, if properly managed, should under any circumstances destroy either its structure or its functions; although even this, if treated early and energetically, may be arrested, and the organ restored both to health and usefulness.

LECTURE XLIX.

TREATMENT OF SECONDARY AND TERTIARY SYPHILIS.

GENTLEMEN: The preceding lectures upon the subject of syphilis were devoted to descriptions of the clinical history, the various complications, the diagnosis, and the termination of the different forms of the disease. The present lecture will be devoted to the treatment of the secondary and tertiary forms of the disease.

In the treatment of secondary syphilis it is not sufficient for the physician to know the number of antisyphilitic remedies, but he should also be sufficiently familiar with their specific action to adopt the course of treatment best calculated to control the variety with which he has to contend. A repetition of what I have said in a previous lecture upon the treatment of primary syphilis will not now be necessary. With the exception of complicated and obstinate cases of constitutional disease, the general course of treatment which I then described will be found as efficacious in the secondary as in the primary forms of the disease.

When, however, secondary syphilis resists mercurials, sudorifics, and tonics, they should be abandoned and other means adopted, which may, in consequence of the existence of constitutional idiosyncrasy, accomplish more than remedies of greater general value. The most celebrated of these which have not already been mentioned are:

1st. Ptisane de Feltz, the active ingredient of which is the native sulphuret of antimony, which has unquestionably, in many aggravated cases, exerted a very salutary influence.

2d. Ptisane de Vigaroux, which is composed of the following ingredients:

℞—Rad. sarsæ opt.,	4 lbs.
Sennæ fol.,	3 lbs.
Guaiac. lig.,	
Potass. bitartratis,	
Aristolochiæ long.,	
" rotund.,	
Sassafras. cort. rad.,	
Rad. iridis,	
Ant. sulphureti,	
Anisi sem.,	
Jalapæ rad.,	
Polypodii,	
Smilacis Chinæ, āā	1¼ lbs.
Vini alb.,	2½ lbs.

To which add 13½ lbs. of water, and digest for twenty-four hours in a sand-bath. Decant, and evaporate to six pounds. Dose, three wineglasses a day.

3d. Ptisane d'Arnaux:

℞—Liq guaiac.,	
Ichthyocollæ,	
Cort. mezerei rad.,	
Cornus Floridæ, āā	1 lb., 9 oz.
Aquæ,	4 lbs., 6 oz.

Infuse.

4th. Ptisane de Lisbonne:

℞—Rad. sarsæ opt.,	
Santali rubri, āā	2 lbs., 6 oz.
Rhodii lig.,	
Guaiaci, āā	1 oz.
Cort. mezerei rad.,	½ oz.
Ant. sulphureti,	2 oz.
Sassafras. rad.,	1 oz.
Aquæ,	8 lbs.

Infuse during the night, and in the morning add one oz. ext. glycyrrhizæ, and boil until reduced one-half.

The ingredients of these remedies I give you because they are not generally used, and may be, in obstinate and difficult cases, of immense advantage, for many are met in California which baffle for many months the skill of the most scientific and experienced.

Muriate of gold was formerly regarded as a specific in the treatment of every variety of constitutional syphilis, although at present it is restricted almost exclusively to cases that have resisted the ordinary remedies. From one-sixth to half a grain may be rubbed upon the gums twice a day, or one-sixteenth of a grain may be given internally morning and evening.

Platinum may be alternated with the muriate of gold, as it is applicable to the same class of cases, and is administered in the same doses.

In chronic and obstinate syphilitic cutaneous affections that resist mercurials, arsenic administered in combination with the extract of stillingia sylvatica, the compound decoction of sarsaparilla, or the ptisanes before mentioned, in doses varying from one-twelfth to one-sixteenth of a grain, three times a day, will in many cases be found very useful, and should be administered when you are disappointed by remedies of better established efficacy, for if not sufficiently active to eradicate the poison, the progress of the disease may be arrested until the susceptibility of the system to the action of specific remedies is restored.

Besides those that I have just mentioned, there are many other remedies, both mineral and vegetable, that have been both recommended and strongly advocated, but which have not been found to possess enough importance to render it necessary that they should even be enumerated. In chronic cases, complicated with a decidedly cachectic diathesis, the preparations of iron are not only considered useful, but are unquestionably very important remedies, when administered either alone or in combination with vegetable tonics and sudorifics.

The tartrate of potassa and the solution of the perchloride of iron are regarded as the most efficacious. The former has been both recommended and prescribed by Ricord as an infallible remedy in the treatment of primary syphilis, although the result of my experience, in the cases in which it is considered most effectual, compels me to consider it of much less importance as an antisyphilitic remedy than it appeared to its distinguished discoverer and advocate. It is, however, in the cases before mentioned, much more useful, and frequently exerts a decidedly beneficial influence. A solution composed of six drachms of the tartrate of potassa to four ounces of simple

syrup, may be administered in teaspoonful doses three or four times a day, until the desired effect is produced.

The perchloride of iron, however, I have found more decidedly useful; twenty drops of the solution in a wineglassful of water may be administered morning, noon, and night; and when sufficiently diluted, enters the circulation, and although it may not exert a specific influence, it certainly invigorates the system, arrests the progress of the disease, and thereby affords an opportunity to prescribe specific treatment successfully. In the treatment of syphilitic rheumatism, in addition to the ordinary remedies, either when the disease exists alone or is complicated with the syphilides, I have found the extract of actea racemosa invaluable. When simple, the iodide of potassium, tincture of aconite root, extract of actea racemosa, combined with simple syrup or the compound syrup of sarsaparilla, will act more speedily and effectually than any other combination. About thirty drops of the extract of actea should be administered three or four times daily, according to the susceptibility of the patient. When syphilitic rheumatism exists in combination with other secondary symptoms, the deutochloride of mercury should be combined with the drugs before mentioned, in the proportion of four grains to a five or six-ounce mixture, and administered as before directed.

In the treatment of secondary syphilis, it is of the greatest importance to attend especially to the general health, for if that becomes impaired the remedies prescribed will not exert their usual influence. If the general health should fail, the mercurials should be suspended, and tonics substituted until the system is sufficiently invigorated to resist the debilitating influence of the mercurial course. Nothing is so injurious, and in many cases destructive, to the patient when suffering from constitutional syphilis, as the rigid diet formerly prescribed. For so soon as the system becomes enfeebled by such treatment during the administration of even the mildest mercurials, diarrhœa almost always supervenes, which is frequently more serious and difficult to control than the specific affection for which the mercurial course is prescribed.

The time necessary to continue the treatment in such cases varies with the duration of the disease and its complications. The rule adopted by Dupuytren was to continue it as much longer as was found necessary to remove all external evidences of the disease.

Local Treatment.—During the progress of the syphilides, warm baths, two or three times a week, are not only exceedingly useful,

but also indispensable to the comfort of the patient, although the daily use of the steam baths, so generally prescribed by their proprietors, cannot be too strongly reprobated. They are not only injurious from their debilitating effect, but also highly dangerous in consequence of the susceptibility to cold being greatly increased, particularly in the climate of San Francisco, where variations in temperature are both sudden and considerable.

Mercurial fumigations should occasionally be recommended in violent and aggravated cases, administered as I have before described. In the treatment of extensive ulcerations of the skin, the most efficient and powerful local application is Monsel's salt, its action being as prompt and satisfactory as in the primary ulcer. The only objection that can be urged against its universal adoption is the pain produced in excessively irritable ulcers by its application. If, however, only a small quantity of the salt be applied, after a few days the irritability is destroyed, the surface becomes healthy, the elevation and the induration of the edges disappear, and then the application of this, the most extraordinary local antisyphilitic remedy that has ever been discovered, will only be followed by temporary inconvenience. Simple cerate should be applied after the use of the salt, and if the ulcers are situated upon the extremities the dressing should be retained in place by a simple roller. Under this local treatment, combined with the constitutional remedies which the peculiarities of the case require, but little difficulty will be experienced in the management of the most aggravated cases of secondary syphilitic ulceration.

The local remedies that were heretofore prescribed, and that are even now generally prescribed by many prejudiced physicians, are those previously described as applicable for the treatment of primary ulcers, and what was then said upon the subject need not now be repeated. Every day's experience convinces me more fully of their insignificance when compared with Monsel's salt, which is the only local application which I employ in the treatment of ulcers, whether simple or specific, and it is exceedingly gratifying to me to see the high encomiums bestowed upon it by other highly respectable and unprejudiced physicians. Dr. Tibbetts, of Iowa Hill, in referring to its use in such cases, says that its hæmostatic powers sink into insignificance when compared with its antisyphilitic properties. His language is both appropriate and expressive, and explains its modus

operandi more satisfactorily than any other terms that could have been employed.

Tertiary Syphilis.—Although some syphilographers doubt the propriety of designating syphilitic affections of the osseous system as tertiary, I am convinced that a sufficient number of well-authenticated cases do not exist to establish even the probability of the occurrence of either syphilitic periostitis or ostitis without the previous existence of secondary symptoms. Generally after the appearance of the syphilides, whether neglected or inefficiently treated, the patient complains of pain in one or more of the superficial bones, which generally increases at night, and may continue for several weeks without the existence of active disease, which is, however, sooner or later invariably developed.

When syphilitic inflammation is located in the periosteum, it is called periostitis; when either upon the external surface, or in the internal structure of the bone, it is designated ostitis. In periostitis, after the inflammation has existed for some time, a slight elevation may be detected, accompanied with pain on pressure, and without any discoloration of the skin, although the pain may be excessively annoying. The tumor or enlargement in this variety of the disease, has received the appellation of node, three varieties of which have been recognized and described. In the first variety, after remaining hard and painful for a few weeks, they become soft, fluctuate slightly, and contain a serous or sero-albuminous fluid, which resembles either the discharge from a scrofulous tumor or synovia. The second variety is accompanied with more pain; the tumor enlarges rapidly, and suppuration speedily occurs. Although the third variety is generally considered as the result of periostitis, the inflammation frequently extends to the substance of the bone, and a tumor is produced which is more solid than that which I have just described, and, being developed in lamellæ, may readily be converted into bone or exostosis, and belongs properly to that class of syphilitic tumors.

Ostitis.—It is very evident that ostitis exists in many cases that are regarded as instances of periostitis, although the bone may be first affected, and the disease subsequently extend to its investing membrane.

When the external surface of a bone inflames, an effusion takes place between it and the periosteum, by which the latter is detached and a tumor developed. In other cases inflammation may take place

in the parenchymatous structure of the bone, and exist for a considerable time without presenting any other evidence of disease, except excessive nocturnal pains. Ostitis may be either circumscribed, or it may extend to the entire bone. When syphilitic inflammation exists, its structure presents a spotted appearance, and grooves speedily form, in which both red blood and a transparent liquid are effused; subsequently a more plastic and organizable matter is deposited, which produces a resemblance to the third variety of nodes.

The tumors resulting from syphilitic ostitis, even after being long painful, are not well defined, being more diffuse and less prominent and distinct than in cases of periostitis. The progress of ostitis may generally be considered as chronic when compared with periostitis, although the induration is greater, and instead of terminating by resolution, suppuration, or gangrene, the enlargement becomes both the seat of supernutrition and an abnormal ossification.

Two varieties of parenchymatous exostoses may result from ostitis, the compact and the cellular. In the cellular variety, bony matter is deposited in lamellæ, with the intervention of areolæ; these are called laminæ or lamellated exostoses. In the compact variety, the tissue is solid, and the bone acquires both increased magnitude and greater density. This variety is known as exostosis eburnée, or the ivory exostosis. These tumors present considerable variety in form, and may be either flat, conical, or partially pedunculated, and embarrass the organs in the vicinity, either by their position or magnitude.

Exostoses may be either external or internal. When external, no difficulty will be experienced in forming a correct diagnosis, but if situated upon the internal surface of the bones of the cranium, ribs, clavicle, or vertebræ, it is then much more difficult to determine the cause of the symptoms and the character of the disease. It is not uncommon, after the disappearance of secondary symptoms, for deepseated pain in the head to supervene, which is generally regarded as neuralgic or rheumatic, and in consequence of the absence of any external evidence of syphilis, an inefficient treatment is adopted and the tumor enlarges, either by an effusion between the bone and the dura mater or by the deposit of bony matter, until sufficient pressure is exerted upon the brain to produce paralysis, which, in tertiary syphilis, is exceedingly com-

mon, and is frequently attributed both by the patient and physician to the treatment, and particularly to the protracted use of the iodide of potassium.

This remedy, when properly administered, never produces the difficulty just described, and the paralysis can be more easily and rationally explained.

When exostoses form in the bodies of the vertebræ, the spinal cord may be subjected to sufficient pressure to produce either partial or complete paralysis below the point affected. Several cases have occurred in my practice in tertiary syphilis, even when under the influence of the ordinary treatment. Whenever, after the disappearance of or during the continuance of any form of secondary syphilis, deepseated pain is experienced, either in the head or in the vicinity of the bones protecting the cavities, whether constant or periodical, and which resists the ordinary treatment adopted in such cases, the existence of syphilitic periostitis, or ostitis, or both, should be suspected, and if not efficiently treated, the most disastrous if not speedily fatal consequences may result.

The iodide of potassium in large doses, combined with the deutochloride of mercury and other efficient remedies, should be prescribed, and if timely and properly administered will generally arrest the progress of the most serious and fatal form of this dreadful disease.

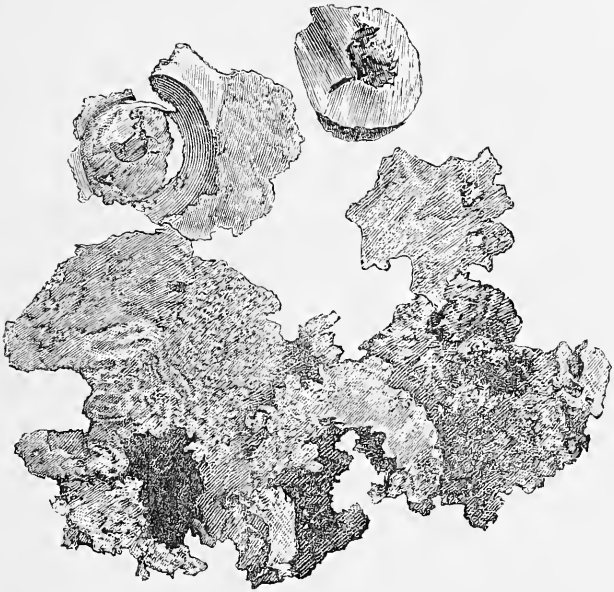
In an aggravated case of tertiary syphilis that occurred in this city, the patient became suddenly and completely paralyzed, with an entire loss of the voice, although his faculties were unimpaired, and he remained ten days in that condition before death occurred. The brain, in this case, presented no evidence of disease, although sufficient pressure was exerted upon the superior part of the spinal cord, by an effusion of a sero-albuminous fluid, to account satisfactorily for the occurrence.

Caries and Necrosis.—In caries only ulceration, or partial mortification of a bone exists, while in necrosis there is an entire loss of vitality.

The bones of the cranium are liable, in tertiary syphilis, to both forms of the disease. When the pericranium only is affected the case is much less serious than when this membrane and the bone are both implicated. When the pericranium is detached from the bone, caries of the external table only results; but if both the dura mater and the pericranium be detached, then necrosis of the denuded por-

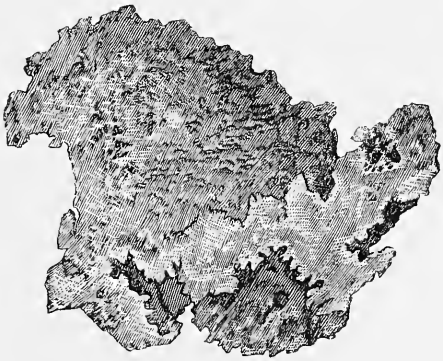
tion of the bone must occur, which Vidal considers not only exceedingly serious, but also that the complete restoration of the destroyed

Fig. 83.



bone is entirely impossible. In this I am convinced he is mistaken, which is proved conclusively by a case which I reported some years ago in the *Pacific Medical and Surgical Journal.*

Fig. 84.



In that case necrosis of the entire os frontis existed, which was removed, and is now, having been often examined subsequently, entirely restored. Two-thirds of the clavicle were also excised for a similar affection, and with the same result.

Both the bones and the cartilages of the nose are frequently destroyed by syphilitic inflammation, which is an exceedingly disagreeable and unfortunate occurrence, both in consequence of the offensive character of the difficulty and of the deformity which generally results from its ravages. The palate bones are frequently destroyed, and this difficulty is frequently accompanied with ulceration of the soft parts.

A very unpleasant case of this kind occurred some years ago in

Fig. 85.

San Francisco, in which an opening extended from the mouth to the nasal cavity, an inch in diameter. After the disease was arrested, and the necrosed bone removed, I determined to make an effort to remove the inconvenience inseparable from such a difficulty by an

operation which, although exceedingly difficult, has been entirely successful. After removing the edges of the mucous membrane with a bistoury, three silver sutures were inserted; lateral incisions were then made, an inch and a quarter in length, on each side of the

Fig. 86.

opening, and half an inch from its margins, and extending to the bone, from which, between the incisions and the margins of the opening, the mucous membrane was entirely detached, which enabled me to place the denuded edges in direct apposition. When the sutures were removed on the seventh day partial union was effected, although it was not sufficiently complete to afford the desired relief. In two weeks the operation was repeated with the result before mentioned.

This operation was so much more successful than was anticipated, that one of a similar character has been performed with ultimate success. Operations of this character are much more tedious than those upon the soft palate, in consequence of the great difficulty usually

experienced in approximating the edges and inserting the sutures, which results from the form and location of the part affected.

Whenever a bone becomes either carious or necrosed from syphilitic inflammation, the affected part should be excised as soon as the disease is arrested by proper constitutional treatment. If caries of one of the long bones exists, the diseased portion may be removed with the trephine, and if necrosed, by any means that will effect that object most readily.

The course of treatment successfully adopted in necrosis of the cranial bones having been before described, it is unnecessary to refer to it again, and in conclusion I will repeat that in the treatment of tertiary syphilitic periostitis and ostitis, accompanied with excessive pain, the application of leeches may occasionally be exceedingly advantageous, although generally every means should be adopted that will support the strength and improve the general health, for upon that depends the success of the physician. In many cases, before specific treatment can be made available, the general health must be improved by tonics and generous diet.

Can tertiary syphilis be transmitted from parents to their offspring? I have known so many females who were suffering from tertiary syphilis bear healthy children, that I cannot believe that it is transmissible.

APPENDIX.

Operation for Deformity of Nose by Injury.

This cut represents a man who lost the end of his nose. It was bitten off in a fight.

Fig. 87.

The photograph was taken before the operation was completed, in order to exhibit to the class the first stage of the operation.

When the flap adhered, the pedicle was divided, and now he is not disfigured at all, except that a slight scar is visible.

Encephaloid Tumor of Bone.

The annexed cut represents a man, named Hoover, who had a malignant tumor affecting the lower jaw.

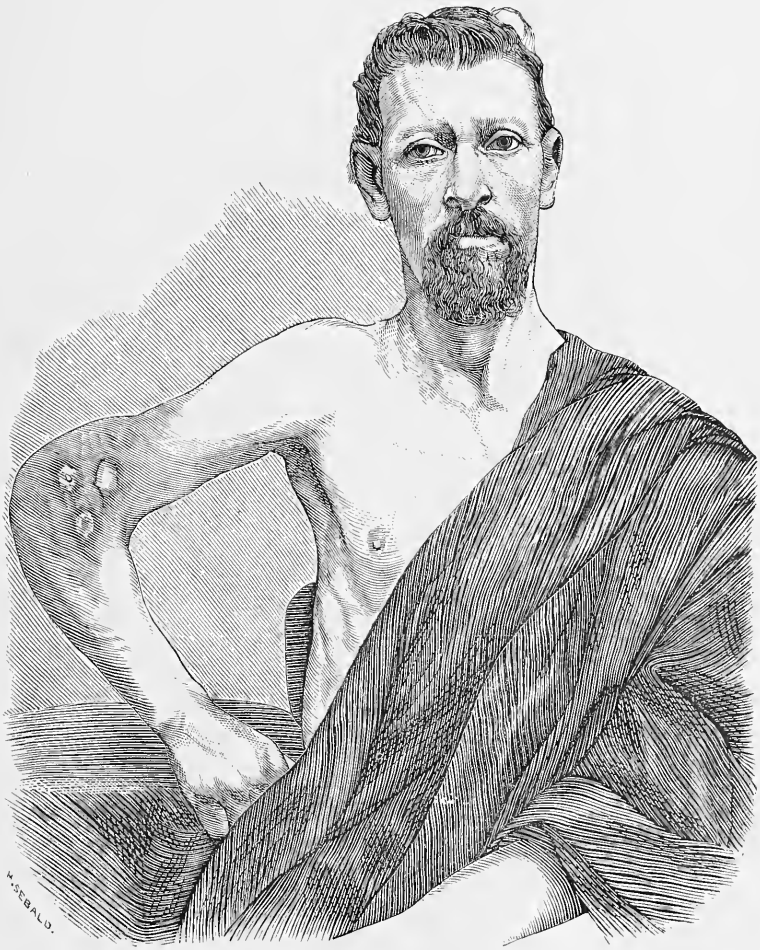
Fig. 88.

The inferior maxillary bone was removed with the tumor. The disease subsequently returned internally, which proved fatal.

Excision of Elbow.

This case was published in the Transactions of our State Medical Society. It was reported to the Society a few years after the operation, the patient also being present, when the meeting was held in

Fig. 89.



this city. His name was John Schultz, æt. 37. The bones of the elbow were diseased as the result of an old injury; they were resected, a chain saw being used. Fig. 89 shows the state of the arm before the operation. Fig. 90 exhibits it when the cure was effected.

He now works in a coal yard, and is as efficient as any man employed there. The entire joint was removed; the motion is perfect,

Fig. 90.

the arm is as strong as the other, and the only difference is in the length. The case appeared in the Transactions of the California State Medical Society, with other cases of a similar character.

Injury of Foot.—Excision of Bones.

This patient, John Blockley by name, was a teamster who traded from Stockton to the interior of the State. He was master of a splendid team, and what is called in this country a "Prairie Schooner," which was capable of carrying about ten tons. One of the wheels passed over his foot, the bones of the foot and ankle were crushed,

Fig. 91.

and he came to me to have his leg amputated. He was emaciated from diarrhœa and nightsweats, and was afraid his foot could not be saved. I removed all of the metatarsal bones at the first operation; in about a week all of the tarsal bones. In a few weeks they were reproduced.

The foot is now as healthy and useful as the other, except that the motion of the ankle joint, although considerable, is not perfect.

Examination of the Rectum.

The annexed cuts (Figs. 92 and 93), represent two forms of rectum specula. They are very important in determining the character of

Fig. 92.

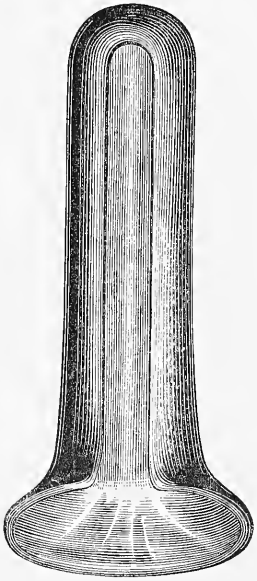
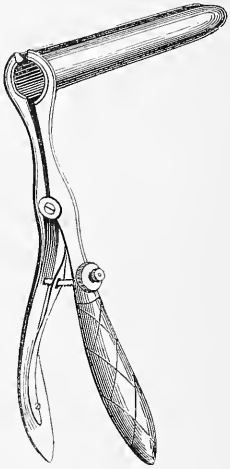


Fig. 93.



the diseases of this part, and particularly of internal fistula, which cannot be ascertained without the use of a speculum.

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